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ABSTRACT

This publication includes presentations made at the Aikin-Stinnett Lecture Series and follow-up papers sponsored by the Instructional Research Laboratory at Texas A&M University. The papers in this collection focus upon the basic assumptions and conceptual bases of teacher education and the use of research in providing a foundation for revision and improvement of teacher education programs. Papers are presented on: (1) a rationale for foundations in teacher education; (2) the proper study of education; (3) notes on a theory of teacher education; (4) research-based teacher education; (5) the instructional cycle and the teaching of teachers; (6) promoting computer literacy in health education; (7) instructional leadership and supervision in special language programs; (8) a performance-based approach to continuing professional development; (9) rethinking Piagetian theory and its implications for teacher education; (10) characteristics of teacher education students; and (11) a cost-effectiveness evaluation in teacher education. (JD)

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NEW DIRECTIONS IN TEACHER EDUCATION:

Foundations, Curriculum, Policy

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NEW DIRECTIONS IN TEACHER EDUCATION: FOUNDATIONS, CURRICULUM, POLICY

Editors:
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Instructional Research Laboratory
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FOREWORD

This publication includes presentations made at the Aikin-Stinnett Lecture Series and follow-up papers sponsored by the Instructional Research Laboratory (IRL) in the College of Education at Texas A&M University. The study of education as part of the required general education of all college students as well as the study of professional education as career preparation for teacher candidates are dealt with in a way that will be new to many who will read this volume. This is not a typical analysis of the knowledge and skills needed to be a teacher in 1984 or another defense of competency based teacher education. Instead, it is a volume filled with vision and imagination from the perspective of philosophers, curriculum designers, learning theorists, policy developers and educational technologists.

This is the second in a series of reports published under the auspices of the Instructional Research Laboratory. Several assumptions have been made in the development of these reports. Their aim is to provide for the communication of essential ideas in a period of rapid change. Recognition is given to the description and analysis of innovative programs as well as to reports of traditional research. Also, the Instructional Research Laboratory attempts to publish the reports rapidly while they are still fresh from recent experience. The products of all College of Education "inquiry groups" are shared openly with all who are interested as part of a collaborative effort to create the future of teacher education.

Dean C. Corrigan
Dean, College of Education
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INTRODUCTION

Contemporary concerns regarding the quality of education have refocused attention on teacher education. While there has been no shortage of proposals to revise teacher education, few have addressed the basic assumptions or conceptual underpinnings of teacher education. The use of research in providing a foundation for revision also has been noticeably absent. It is the intent of this volume to begin to focus attention in these directions. We believe it is imperative for the arm of the teaching profession that is responsible for the research tradition to direct that research toward the improvement of its own programs.

Section I of this volume is a compilation of viewpoints on the undergirding theory of teacher education. George F. Kneller of the University of California Los Angeles views the study of education and pedagogy as two different concerns. He states that the study of education is such an important undertaking that it should be a regular part of the curriculum for all students, not just those preparing to be teachers. He then suggests elements that should be included in that study.

Maxine Greene, Teachers College, Columbia University, calls for a rethinking of the definition of excellence that goes beyond narrow issues and includes attention to the nature of the teacher, the subject matter that needs to be transformed and communicated, and the diversity of learners. Upon this triad of concerns she challenges the reader not to passively accept conventional wisdom but to be reflective and active in seeking an adequate definition of the meaning of excellence in teacher education.

Robert E. Shutes, Department of Educational Curriculum and Instruction, Texas A&M University, emphasizes the importance of theory in guiding research and development efforts. He identifies a number of issues related to academic foundations, professional education and teaching fields that need to be addressed when developing a theory of teacher education.

Section II of this volume focuses attention on the curriculum of teacher education. The papers in this section touch on a wide range of issues from a variety of perspectives.

In the first paper in this section William H. Peters, Department of Educational Curriculum and Instruction, Texas A&M University, suggests that there is an emerging research base on teacher effectiveness that should be used in redesigning teacher education programs. However, he cautions against a simplistic application of this research to the complex problems of teacher education.

Ernest T. Goetz, Department of Educational Psychology and Patricia A. Alexander and Christine Burns, Department of Educational Curriculum and Instruction, Texas A&M University, focus on instructional aspects of teacher education. They suggest that the teacher as a model affects the learning of preservice teacher education students and influences how the candidate views the teaching act. They examine traditional modes of instruction and provide recommendations for enhancing instruction in teacher education programs.

B. Sue Beall, Department of Health and Physical Education, Texas A&M University, reports on a research project designed to improve computer literacy of health education students. Her findings suggest that teachers need to evaluate software

from the perspective of the learner as well as the perspective of the teacher.

Viola Florez-Tighe, Department of Educational Curriculum and Instruction, Texas A&M University, addresses the need for supervision and leadership in English as a Second Language programs. Her paper suggests that preservice preparation must be reinforced in the field with well trained instructional supervisors. Her suggestions have implications for creating environments conducive for professional practice for all teachers.

Robert A. Fellenz, Department of Interdisciplinary Education, Texas A&M University, brings the perspective of an adult educator to the design of continuing education programs. He advises that competency based programs can be extended to the design of in-service or continuing education programs for all professionals.

The third section of this volume deals with policy issues in teacher education. The first of these articles by J. Diane Fugua, Patricia A. Alexander and C. Stephen White, all of the Department of Educational Curriculum and Instruction, Texas A&M University, encourages the evaluation of misconceptions that undergraduate students might develop as a result of an incomplete understanding of selected human development theories. These authors point out inappropriate practices that have developed as a result of the application of Piaget to the preparation of teachers for young children. They cite research evidence which suggests that a broader base of conceptual understanding of cognitive functioning is needed by teachers of young children.

Tom V. Savage, Department of Educational Curriculum and Instruction, Texas A&M University, addresses the issues of the academic characteristics of individuals selecting education as a career. He reviews research and suggests the need for more data in making policy decisions designed to impact those choosing education as a career.

In the final article, Jon J. Denton, Department of Educational Curriculum and Instruction, Texas A&M University and Nick L. Smith of the Northwest Regional Education Laboratory, report the findings of a cost effectiveness study on two teacher preparation programs. Cost effectiveness studies have been rare in teacher education. However, data gathered using this methodlogy may be very useful in rendering policy decisions.

It is the hope of the editors that this volume will stimulate research in teacher education so that reforms in teacher education will have not only a foundation for present practice but a process for future revisions.

T. V. S.
J. J. D.
W. H. P.
October, 1984

Section I Foundations

PERSPECTIVES AND VISIONS: RATIONALE FOR "FOUNDATIONS" IN TEACHER EDUCATION*

Maxine Greene

Teachers work in multiple contexts, ranging from the immediate contexts of their classrooms to the larger contexts of political and social life. There is the immediacy of the felt encounter, the memo, the workbook, the blackboard, the bell. There is the sense of the surrounding institution with its hierarchy, its demands, its rules—the faces appearing, the voices sounding, the calls to accountability. There is the community or the protesting parent, now by a group of parents or a school board or a district office; and, somewhere in the distance, there are the state and federal agencies with their regulations and requirements, their determinations of what is happening and what ought to happen within the schools.

And now, with all sorts of spotlights abruptly turned on education, with a spate of reports emerging from all sorts of commissions and foundations and centers, teachers are expected to direct their attention to all kinds of articulations of where American education is deficient, of what its goals should be, of what changes ought immediately be made. The token word, the magic word, the one that sums up what the report writers and the investigators wish to be viewed as the central goal is "excellence," presented (not for the first time in our history) as an antonym of "mediocrity." Given what has been taken for granted for a decade, it refers for most people to higher achievement levels as reflected in test scores and to a higher level of what is called "literacy." Literacy, sometimes specified as mastery of the English language and/or higher attainment (particularly in mathematics, science, writing, and the use of computers) is presented as a necessity for a "nation at risk." That means that we are to strive for excellence in the name of productivity, national defense, and technological primacy in the world. It also appears to mean that our priorities are to change: we are asked, in the "national interest," to set aside our relatively recent concern for equity.

It is interesting to ponder older views—arete, say, Erasmus's notion of the moral virtues and Christian piety; Jefferson's idea of developing the reasoning faculties of the youth, enlarging their minds, cultivating their morals; Cardinal Newman's description of the person "who has learned to think and to reason and to compare and to discriminate and to analyze . . ." There is something strange about the report writers' choosing to tap into the old humanist tradition in their effort to legitimate a certain range of largely technical competencies to promote what is called the "national interest." More recent statements having to do with excellence—John Gardner's *Excellence: Can We Be Equal and Excellent Too?*, the Rockefeller brothers' report of several years ago—did not define the term so narrowly; and it is tempting to wonder why.

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*Paper presented at Aiken-Stinnett Lecture Series, College of Education, Texas A&M University, February 23, 1984.

How are teachers and teachers-to-be to respond to what is being said? How are they to define its relevance for what they do each day? One would hope that, at the very least, some of them have been empowered to conceptualize what is happening against the background of our history, to distinguish between polemic and serious proposals, to understand that values and goals cannot simply be legislated into existence—that, in some sense, they are always in the making in a continually changing world. But, when I think of the perspective of the commissions and the difference between that perspective and the one required of administrators and teachers in actual schools, I think of the difference identified at the beginning of Thomas Mann's *Confessions of Felix Krull, Confidence Man:* between seeing the world small and seeing it big. Great men, Felix thinks, statesmen and empire-builders and other lenders "must be so constituted as to see the world small, like a chessboard, or they would never . . . deal so boldly and cavalierly with the weal and woe of the individual." The alternative is to regard the world and the people in it as something great and significant, or taking "a magnifying and respectful view." Commission members and report writers, with rare exception, see the world small or at least see the individuals within it in such a way. Educators who are actually present, in classrooms or principals' offices or district offices, would find it hard to look over the individuals they are expected to educate and tell them that national security depends upon their doing well on their chemistry tests or that the likelihood of economic primacy hangs on their exerting themselves in writing and math. More important, practicing educators cannot look upon students as members of an aggregate, or "cases," or instances of some larger condition. Teaching is triadic, most of us know; it involves someone teaching something to someone—or, I would prefer to say, enabling someone to learn how to learn. The point, though, is that every term of the triad has to be attended to: the living being who is the teacher, intentionally trying to provoke persons to reach beyond themselves, to become different, to enter a state more desirable than the one they are presently in: the subject matter, conceived as a specific symbol system, a structure of related concepts, a perspective, a set of know-hows—all in the process of transformation into communicable, appropriately communicable form; and the learners in their particularity and variety, with their diverse biographies, their different degrees of interests, their different levels of readiness and skill. None of this makes the call to excellence inherently meaningless; but it does demand that the voices of practitioners be heard. It does demand a testing, if you will, of the abstract formulation—whether overly optimistic or overly carping—against lived situations, against what is empirically known.

Lawrence Stedman and Marshall Smith, for example, writing about the reform proposals in the *Contemporary Education Review*, look at such indicators of decline in achievement as those presented by the College Entrance Examination Board and the National Assessment of Educational Progress. It is true that very high test scores have dropped, and there has been a steady decline in science achievement scores of 17-years-olds; but Stedman and Smith stress the poor treatment of the data and the "abominable nature of national data on school performance." Their point is not that educators should not respond to the call to improved achievement; it is simply that the existing evidence does not warrant some of the sweeping claims. Changing populations have not been taken into account, for instance; incommensurable samples were used in determining that high school curricula had been diluted; favorable comparisons with

other countries were ignored. Similar things might be said about the proposals for longer school days and longer school years. Trying to make sense of it all, educators must at least hold in mind the likelihood that many of the reports are responding more to economic problems in this country and to still questionable predictions about our high-tech future; they are political documents, it should be understood, as much as they are educational reports. And, clearly, educators of all sorts have to keep asking—and have to be enabled to ask, provided the language for asking—"What do we want for our children? What does all this mean for the practitioner? What does it actually mean?"

Whether or not you read this moment of our history as I do, whether or not you feel yourselves to be living in a highly administered society where power often wears a blank and smiling face, where you have no chance to *explain* to the communicators how it is and how it feels to live as you live and do what you do—no chance to persuade them of what you yourselves believe to be good and right, where the words fall about you like hailstones very often, words of reassurance mingled with talk of megatons and first-strike capability and early warning systems and peacekeepers or peacemakers. You must admit some degree of perplexity with regard to the prescriptions being issued with respect to education—not merely the talk of dangerous declines, but talk about discipline and prayers, about voucher systems and tax credits, about—yes—maximum competencies for every child. *The New Yorker*, a while ago, writing about the news blackout on the Grenada invasion, talked about the way in which the people "dispossessed of their right to participate in the conduct of the people's business, have become a mere gallery of spectators of their own affairs." Not only do I believe this a catastrophe for a democratic citizenry (one to which public education ought somehow to attend); I believe it describes the way many of us in education are being made to feel. That is why we have to choose ourselves, as never before, with respect to what is being said and left unsaid—and commit ourselves afresh, especially those of us who are teachers and teacher educators, to what we believe about the search for meaning, clarity, intelligence, community, compassion, imagination, ordinary decency. Irving Howe, in this connection, said a few days ago (while at a humanities conference in New York) that "The very word 'excellence' ought to make us cringe a little, so thoroughly has it been assimilated to the prose styles of commission reports, letters of recommendation, and hair spray commercials." He said the word was being used as a code word for "educational Reaganism," which he associated with tougher testing, increased discipline, and merit pay; and, like others, he saw it as anti-humanistic in what it implied. Be that as it may, we are challenged to try to reconcile what is being asked today with what we know—from experience—about injustices and deficiencies in our society, about the ubiquitous sense of powerlessness and passivity afflicting people, about the discrepancy between existing value systems and the technology we have at hand.

Clearly, I want to hear our community speak out—and sometimes rebel—in the name of reflectiveness and perspective and social concern, and on behalf of a common world. It is probably obvious that I believe teachers-to-be cannot adequately cope with it all if they are not introduded to historical explanation and ways of gaining historical perspective on what is happening, and if they are not equipped to do philosophy with respect to the language, the prescriptions, the assertions of value evident around us—

to clarify what they are hearing with some degree of rigor, to break through obfuscations, to reconstruct arguments, to ponder what is worthwhile and what is worth striving for, to think about their own thinking, consciously to create meanings as they live. None of this, as you well know, happens "naturally." The ability to "read" or to interpret social and political situations does not occur without becoming involved with experience and lived situations. It has to do with the funding of meanings, or the sedimentation of meanings, all sorts of meanings. These become part of and indeed constitute the self; they compose the background against which new encounters, new experiences are projected. To educate someone, it seems to me, is—in a very fundamental sense—to add to the richness and multiplicity of such meanings. It is important to remember (as Dewey also said) that the realm of meanings is far wider than that of true-false meanings. It includes moral meanings, poetic meanings. It includes, I would add, the kinds of meanings some people achieve when they realize they are capable, along with others, of repairing what is deficient and painful, solving complex social problems, altering—to some degree—the order of things. It must be said as well that, although we are all individually "condemned to meaning," to making our own sense of things and finding some reason for living our lives, the ways of knowing that we must undertake, the questioning, the wondering are not of the sort we can wholly invent for ourselves.

One of my concerns in the face of the recent reports has to do with a narrowing, a channelling of human possibility. If stress is placed on a prescribed range of literacies, if human beings are thought of primarily as "resources" to promote the national interest, opportunities for differential growth and development may be severely limited. We need but think of those whose strengths and talents are not especially prized today: the Henry David Thoreaus of tomorrow, the Margaret Fullers, the James Baldwins, the Helen Caldecotts, the Gregory Batesons, the Tim Berrigans. I think of the persons peculiarly qualified to start storefront schools in inhospitable neighborhoods, those out to save the rivers, those who engage in civil disobedience to stop nuclear war. I know full well that there has often been tension in this country between a single standard of achievement and bearing and being—and a sense of the richness of multiplicity; and I want to keep the tension in existence. Teaching Emerson's *The American Scholar* the other day, I was reminded of that when he talked about "the literature of the poor, the feelings of the child, the philosophy of the street, the meaning of a household life" which he said were the "topics of the time." And, by chance, I happened on an article by Irving Howe in *The New Republic* having to do with the "use and abuse of excellence" and found him reminding us that the cultural standards in our country have never been as fixed or secure as we sometimes think—but "must always be subject to the bewilderments of a rapidly changing culture. It means," he said, "that the small community of intellectuals, writers, and scholars professionally devoted to the life of culture, though sometimes fancying itself an aristocracy of letters beyond any soiling plebian touch, must be ready to welcome into its ranks newcomers who bring with them the unruly, the uncouth, the 'barbaric'." I thought of Whitman's great "en masse" when I read that, Whitman who—for John Dewey—was the "seer" of democracy, viewed as "a name for a way of life of free and enriching communion." And this summoned up for me the hope and the tensions associated with the constant stream of newcomers into this country—with their

different cultures, accents, standards, and capacities. And it occurred to me how much worse than small communities of intellectuals may be government commissions and report writers, if they are given the power and the platform to prescribe to those who have no voice and who feel bound to comply.

There is a warrant for thinking of excellence, then, in a plural sense. We might want to look adjectivally at such excellences as consisting in the development of particular capacities like critico-creative thinking, integrity, autonomy, fidelity, imaginativeness, adventurousness, self-reflectiveness, cooperativeness, moral sensitivity even strength of will or persistence or stubbornness. Now it is clear enough that it means little to speak of a capacity like critico-creative thinking without taking into account the ways in which such a capacity is displayed or finds expression in some recognizable form of activity—solving problems in mathematics, decoding and achieving meaning in a short story, interpreting media messages, responding to threats to the environment, organizing literacy programs, reading lived situations to discover what needs to be repaired. Or, as we are more likely to do, we might consider how they are displayed or might be displayed in one or another of the subject matter areas, in and through the academic disciplines, or in crafts or in games. Any one of these activities may offer evidence of a particular kind of intelligence or the use of several intelligences; and, even as each one has what Gardner describes as its own "developmental trajectory," the capacities I am speaking of cut across the various frames. Again, I would use the term "excellence" to refer to a capacity and its expression rather than to what Gardner calls the "potential" he identifies with intelligence.

Let me offer two analogies, and you can think of more. The first is found in my experience at an aesthetic education institute where I teach in the summers. Often, when I arrive at the Juilliard School at 8 o'clock on a hot morning, I meet a young woman Balanchine dancer, who tells me she has been at the barre or, perhaps, in class since 6:30 or 7 a.m. She has not been at the barre or in class because she has been instructed to do so or because doing so is a prerequisite for her present job at our institute. She has spent her early morning hours that way because that is part of what being a Balanchine dancer means, and she has chosen herself to be a member of that particular normative community governed as it is by certain standards having to do with effort and shape and muscular control and flexibility. It seems more or less self-evident that she possesses what is called bodily-kinesthetic intelligence—involving a sense of timing, an ability to use her body in particularly skillful ways and to control her own movements in ways most of us cannot. Simply to assert that she posesses that kind of non-verbal intelligence, that she can speak the language of the body, would be meaningless if she had no opportunity to learn to dance or to mime or to act. But there is more. She is, for me, a model of excellence because she continues striving, on her own initiative, in accord with the norms governing her particular dance company, to become what is thought of as a Balanchine dancer—and because the striving and the choosing of herself will never end, so long as she is in that world. That means, for me, that she is expressing such capacities as integrity, autonomy of choice, imaginativeness, fidelity, if not necessarily critical thinking or analytic skills. If she had not developed such capacities, or if she had had no opportunity to display them, it is difficult to think of her realizing her potential—or actually *becoming* intelligent in a bodily-kinesthetic way. Also, it would be hard to speak of excellence. I would

emphasize that what is important is her quality of mind, the manner in which she addresses herself to her project, the ways in which she deals with the situations in which she finds herself.

Another analogy I have in mind is to be found in the work two students did in establishing a store-front day-care center in a neighborhood in New York City. In this case, too, the norms governing a particular community were named and attended to—not simply those governing the people who establish and teach in day-care centers, but those relevant to the people on the blocks concerned. It meant coming to know the regulations, making the requisite preparations to satisfy the health department, securing contributions of toys and paints and plastic cups, visiting—day after day, night after night—working mothers, grandmothers, teen-age sisters or brothers, talking, talking with little children—freely working, honing a variety of intelligences (linguistic, certainly, logical, personal—making distinctions, effecting relations with others, understanding others) and several more. At once, these students are expressing capacities like integrity, concern, fidelity, imaginativeness, critico-creative thinking, and the rest. I would apply the word 'excellent' to what they are doing; but I am much afraid that, according to present-day definitions, their prowess and proficiency would seem insignificant, if they were to become visible at all.

Now I grant that my dancer friend and my students had already mastered the basics or the skills fundamental to what they are doing before coming on stage or on the street. What the dancer does today on her own initiative would be inconceivable if she had not mastered—through stringent and repetitive effort, through what can only be called training, the foundations: the positions, the extensions, and the rest. She might say that, rigorously drilled though she was, she actually began learning when she began teaching herself: going *en pointe* before her mirror at home, trying out certain contractions in new combinations, going beyond what she was drilled to do in ballet school. The training for my day-care center friends was not so specific or so specialized; but, clearly, they had to learn the ropes where dealing with state agencies was concerned, and even where ethnic minorities and their children were concerned. And it was only when they began walking up and down those blocks, ringing bells, talking to people, going back to check that the windows were secure at the center, that there were fire extinguishers and the rest, that they began teaching themselves—began actually learning to learn. Many of you recall going beyond like that (if you were lucky enough to have someone empower you)—practicing with syllables and words, making up rhymes, saying the alphabet backwards, spelling out words you had never learned on building walls and street signs. If you were really fortunate (and many of us were) you managed, largely through your own undertakings, to grasp (like that student dancer) a way of doing things. When you did, you may have begun playing around with what you had mastered—using cuisenaire rods, say, diagramming sentences, keeping a log, taking apart and putting together alarm clocks, reading books your mother took out of the library for herself—practicing what you had gained in your own way, making it your own.

Obviously, the ways of doing things are more or less specific to each field: learning the ropes when it comes to decoding sentences is different from learning the ropes when it comes to multiplication tables. The principle is the same, however. Enabling someone to master the basics in any field involves making available a

method, a mode of procedure; and, I would hope, somehow explaining that it represents a *modus operandi* that works for many people and is worth trying out, and that there are always others that might be tried or even invented, depending on where the person begins. What has been learned in free writing, for instance, may be practiced on one's own, tried out in new formats, with all the risk of error it entails. One can take the risk thoughtfully and with a degree of care, correcting the errors, for instance, before going on. Or, having experimented with the free writing model, one may decide that it is better to plan what one is going to say, shape it somehow in advance. One may come upon a better way of proceeding as one continues to teach oneself. To work from the rudiments one has mastered in this fashion is quite, quite different from being required to master a range of discrete competencies or to gain a set of what some call "knowledges." There will be an awareness of process, a consciousness of exploration, of continually moving to what is not yet.

Much the same applies, I believe, to learning the cognitive styles that identify the various "provinces of meaning" in which the various disciplines are found. To move, say, from the common sense world in which people live their everyday lives along with others into the world of natural science demands a certain kind of knowing how. Not only are there specific protocols to be mastered, a mode of theorizing to be learned; there is a distinctive language into which to move, a symbol system; and there is a way of directing attention to those aspects of the world selected out for study that is different from the way of directing attention to, let us say, the social or the human world, populated with fellow human beings. In the province of the natural sciences, as in the province of the social sciences or of the arts, there are favored cognitive styles, compatible modes of procedure of sense-making; but, in the gaining of perspective each province makes possible, there is room for personal interpretation, selective attending, risk-taking. Individuals inhabit—or dwell in—a particular province with some awareness of their own biography, life-story, life-project; and they ought to do so for the sake of attending more mindfully and more solicitously to the situations in which they find themselves.

I would want to lay particular emphasis upon a taking into account of the actually lived world—where the search for meaning originates and where it finds its consummations. What we call our knowledge constructs or the sets of know-how that make them possible are layered on our perceived landscapes, the world as patterned by childhood explorations, imagining, perceiving. There is a perspectival way of seeing, hearing, knowing that is associated with childhood, a sense of horizon and wanting to leap beyond. For me, educating in any sphere ought to involve a recognition of those origins, not an overwhelming of them or a substitution for them by micro-worlds or fixed definitions or one-dimensional prescriptions. Yes, we want to introduce the young to the forms of knowledge—the languages that constitute sense-making in our culture, that make the cultural conversation possible; and we want to do that in richer and more complex and more challenging ways. At once, we need to keep alive the young people's own stories, the consciousness of embeddedness in particular landscapes, in lived worlds to which the natural sciences and the human sciences and the arts and humanities refer. Such attentiveness to lived situations ought to continue, if we are concerned with empowering persons to name their worlds, to look through widening and diversifying perspectives, not only at the everyday but what surrounds

the everyday and what reaches back in time—what extends forward into what is undiscovered, what is not yet.

But this brings up another issue, one that ought to be of particular concern to teacher educators and that argues once again for attention to the contexts in which schools and those who work within them exist. If we acknowledge diversity and the presence of newcomers, we have also to acknowledge the existence of tensions or dissonances between the cultures of many students and the so-called "official" culture (whether described as "common learnings" or not). It is evident to almost all of us that what is in many senses "given" to certain educated, well-socialized, perhaps privileged groups in our society does not come easily to young people from other backgrounds whose lived lives and whose family lives are different in many, often overlooked ways. There are styles of thinking, ways of talking, funds of meaning transmitted by families who are newcomers to the mainstream that cannot but mediate what is taught in school—including the symbol systems we often take for granted as the only ways of thematizing a complex world. Not only is there a danger of further alienating such students by a lack of attention to what they live and what they know; there is a continual danger in the tendency to disconfirm their experiences and responses—because they do not participate in what we conceive to be "literate" discourse, because they do not value what we take for granted as valuable. Surely, it ought to be one of the responsibilities of teacher educators to acquaint teachers-to-be with sociological and demographic realities, even as it ought to be one of their responsibilities to enable people to attend, to try—now and then—to perceive what is taken for granted through others' eyes.

Equally important is the need to attend to the ways in which popular culture, including television programs and popular music and films, structures many young people's experience—fragments it, highlights it, offers symbols with which to represent it. For great numbers of young people today, the sounds of rock, the dizzying images of video, the bursts of pictured violence overlay and permeate their lived realities. They live, very often, bombarded with shards of sound and imagery, particles of information, slivers of news; and we who are teacher educators have to be aware of this even as we try to make available the sets of know-how that are so important in learning, even as we try to make visible and audible a more coherent, integrated world.

It is a matter, yes, of nurturing mindfulness; it is a matter of opening perspectives; it is a matter of empowering persons to become critically conscious of what works upon them and dominates them and sometimes coerces them from without. We ourselves have not yet learned enough to meet the challenge of the so-called information society—a challenge implicit in an overabundance of fragmented information, in an intense product orientation that obscures process and experiment and doubt. We have not met the challenge of the present confusion between information and knowledge; we have not learned to enable people to create knowledge out of information. We have not really discovered how to help them recognize television programs as artifacts rather than openings onto the common world. It seems to me that, if we are to educate for mindfulness, for a quality of attending, we need somehow to enable the young to recover themselves, to recover what might be called a lost spontaneity. By that I mean to regain contact with their original landscapes, their original sense of horizon, of the not yet. Of course we cannot sweep away the

symbolisms and the distortions of popular culture; we cannot simply substitute for it what we believe to be a more desirable, more liberating, more humanizing system of meanings. But we can do more to create the kinds of situations that release preferences, as Dewey once said, spontaneous preferences. We can create situations in which people begin once again to speak to one another in their own voices, to find out what they think by articulating, by expressing. Merleau-Ponty has written about speech as a genuine gesture, a kind of action that carries meaning to another. Expression, he said, brings meaning into being. Meaning and thought appear as a certain kind of silence is transformed. Our view of human beings, he believed, will remain superficial if we do not go back to that origin, if we do not try to find "beneath the chatter of words, the primordial silence" and do not try to describe "the action which breaks this silence." The spoken word, he said, "is a gesture, and its meaning, a world." To think that way, for me, is to think about enabling the young to come back in touch with what has been drowned out by the noise of the culture—the false languages of entertainment, the cost-benefit language of official explanations, the taken-for-grantedness and the passivity to which both give rise. It is to empower them to experience incompleteness—incompleteness and the sense of possibility. Only then are people likely to reach beyond themselves towards the horizons of their own lived lives. Only then are they likely to pose their own questions, to choose to learn to learn.

Openings are what is needed, openings and a consciousness of multiple realities. In the quest for a heightened quality of attending to situations, for a diversity of excellences, we need to think of the role of imagination as an opening to what is not yet. Imagination enables human beings to look at things as if they could be otherwise, to envisage alternative realities. At once, as Virginia Woolf once said, it enables them to "bring the severed parts together," to effect unexpected connections in experience, to create new orders, new spaces in which to move. Wallace Stevens wrote a poem called "Six Significant Landscapes" that suggests, especially in its last stanza, what this might mean.

> Rationalists, wearing square hats,
> Think in square rooms,
> Looking at the floor,
> Looking at the ceiling.
> They confine themselves
> To right-angled triangles.
> If they tried rhomboids,
> Cones, waving ellipses—
> As, for example, the ellipse of the half-moon—
> Rationalists would wear sombreros.

Pondering those words, I go back to the reports for a moment and think of the confined places the new prescriptions seem to create. It is probably clear that the poet is not saying that square rooms ought to be locked or that rational thinking ought to be forbidden. He is, after all, a poet discovering and setting forth resemblances between a certain kind of linear thinking and what might be called one-dimensionality. When he uses the term "Rationalists," he is inventing a metaphor that links a type of formalism and academicism to closed-in spaces, to predefined limits, to boundaries. The square hats respond to the square rooms, in the sense human reason was once thought of as a microcosm of the ordered, law-governed universe, itself bounded, mathematically

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defined. As we who read move through the lines, we may feel ourselves moving outward beyond the boundaries to other sorts of spaces. Or may feel the triangles themselves involved in transformations, becoming rhomboids, cones. Then, suddenly, we are released to go still further—beyond diagram and abstraction to the actuality of the half-moon. If the rationalists have chosen to go with us, they themselves have been transformed, with their hard hats, their mortarbords becoming somehow pliable, dashing, shading the eyes and yet allowing glances at the moon.

I experience a consciousness of enlargement when I read that poem; and, when I put down the book and return to my teaching life, I find it subtly changed. Stevens has not taught me a new truth; but he has made me see what I already know somehow differently. I have been moved to reflect again on the place of reason in sense-making—the unquestionably central place of logic, mathematics, of cognitive acts like drawing inferences, defining, categorizing, generalizing, theorizing. I have become absorbed in pondering what I suppose might be called conceptualizing: making connections in experience, schematizing, patterning, ordering with the help of concepts like, say, figurative language, economic causation, simulation, organism, each derived from a particular subject matter field or discipline, each governed by a particular set of criteria or standards and associated with distinctive protocols, methods, ways of knowing how. And then I recall Immanuel Kant's reminder that "concepts without percepts are empty; percepts without concepts are blind." And I think again how important it is to ground such activities in a perceived landscape, a landscape of appearance, of shapes and sounds and colors apprehended from the standpoint of a living being enmeshed in an intersubjective world. There are, of course, disciplines—mathematics, let us say—that are characterized by a kind of formal purity that suggests a self-existence in some supersensible realm; but we do understand by now that mathematics is one of the languages available to us, the teachable languages, whereby phenomena can be related in specifiable ways, measured, equated, augmented, reduced, analyzed. W. H. Auden once wrote that "The Kingdom of Numbers is all boundaries . . . ": and those words, like Stevens', remind me of the importance of drawing reflective attention now and then to the perceived world where conceptualized objects exist as presences, reminding us why we "do" mathematics in our persisting quest for meanings, our restless effort to name and interpret our lived worlds. I cannot but recall Lewis Thomas—in *The Lives of a Cell*—talking about the phenomenon of the transformation of random matter into "the ordered dance of living forms," how that transformation has been thermodynamically explained as a flow of energy from the sun to outer space by way of earth—energy mathematically destined to cause the organization of matter into an increasingly ordered state. And Thomas writes of constantly changing conditions or rearrangement and of "a chancy kind of order, always on the verge of descending into chaos . . . " And then:

> If there were to be sounds to represent this process, they would have the arrangement of the Brandenburg Concertos for my ear, but I am open to wonder whether the same events are recalled by the rhythms of insects, the long, pulsing runs of birdsong, the descants of whales, the modulated vibrations of a million locusts in migration, the tympani of gorilla breasts, termite heads, drumfish bladders. A "grand canonical ensemble" is, oddly enough, the proper term for a quantitative model system in thermodynamics, borrowed from music by way of mathematics. Borrowed back again, provided with notation, it would do for what I have in mind.

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It is this sort of thinking that draws the rationalist from the single vision of the square room and makes him/her no less a mathematician or a logician or theoretical physicist. It is this sort of thinking that allows for the expression of more than one capacity in a chosen mode of activity. I think, in this highly technical period, this technicized moment of time, that we as teacher educators and teachers are all concerned about the seductions of the purely linear, the depersonalized, the morally neutral. Thinking of excellences in relation to the range of capacities and the multiple intelligences mentioned above, I would argue for enhanced attentiveness to ellipses and to Bach and to birdsong in whatever guise or order is appropriate for learners whose attention is directed to their worlds.

If there were time, I would argue for an increased centrality for the arts in teacher education and in the schools as well, and for an emphasis on informing awareness so that more and more art forms may be actively realized by diverse human beings in search of meaning, in search of clarity, in search of themselves. I often think of engagements with Stevens and Cezanne and Mozart and Alice Walker and Twyla Tharp and Tennessee Williams and so many others as paradigmatic for all learning because of the demand they make that the beholder or the listener be there in person, that he/she make an active and authentic effort to *achieve* the work, to bring it into existence for himself or herself. It is paradigmatic too because work must be done to realize it, the kind of work that involves a break with the conventional and the indurated (as Dewey put it), that opens to unsuspected possibility. Moreover, as Jean-Paul Sartre said about the writer, an artist appeals to a percipient's freedom and the work can never be entirely complete, can never be an end. The true end, Sartre wrote, which freedom itself adopts as its own "is what we call a value. The work of art is a value because it is an appeal . . ." It is an ongoing appeal; it is a demand—to use the poet Rilke's phrase—that "You must change your life." I cannot but wonder how excellence can be sought in the absence of such encounters, such appeals. I wonder as well how excellence can be sought if there is no space for encounters, no space for people to find their own voices, to speak for themselves.

A space for expression, a space for freedom, yes, and a public space. By that I mean, as Hannah Arendt did, a space where living persons can come together in speech and action, each one free to articulate a distinctive perspective, all of them granted equal worth. It must be a space of dialogue, a space where a web of relationships can be woven, and where a common world can be brought into being and continually renewed. Arendt was always interested in what she called the fact of natality, the idea that we have all come into the world by being born and that the world is constantly being renewed through birth. So she was always concerned about newcomers and new beginnings, as she was concerned about what it means to act in concert, to resist violence and passivity at once. She developed a notion of freedom in the context of a vision of a public space and on the ground of a belief in new beginnings. In any case, she wrote:

> Education is the point at which we decide whether we love the world enough to assume responsibility for it and by the same token to save it from that ruin which, except for renewal, except for the coming of the new and young, would be inevitable. And education, too, is where we decide whether we love our children enough not to expel them from our world and leave them to their own devices, not to strike from their hands their chance of undertaking something new, something unforeseen by us, but to prepare them in advance for the task of renewing a common world.

Even as I believe a range of other literacies, I want to believe that there is a teachable capacity to bring into being an "articulate public" in a situation like the one Arendt described—a public composed of persons with many voices and many perspectives, out of whose multiple intelligences might come a durable and worthwhile common world. If we can think like that, if we can empower persons in the multiple domains of human possibility somewhat better and more energetically than we do, we shall not have to fear a lack of productivity, a lack of dignity or standing in the world. We will be in pursuit of the crucial values; we will be creating our purposes as we move. And move we must, in our multiple contexts, towards an untraveled world (to paraphrase Tennyson), whose margin cannot but fade for ever and for ever as we move. "How dull it is," the poet said, "to pause, to make an end." We are educators. The point is to begin.

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THE PROPER STUDY OF EDUCATION*

George F. Kneller

My topic tonight is the proper study of education or what makes education an academic discipline. I shall have little to say about the process or the profession of education, about schooling or pedagogy. My purpose is to illuminate our common endeavor and justify its place along with other disciplines in the university curriculum, especially at the undergraduate level. My text is taken from Alfred North Whitehead: "We are only just now realizing that Education requires a genius and study of its own." Much that I say will not be new to you, but I believe that my message is especially timely today, and I hope it will encourage you to make our study the discipline it ought to be.

First, let me propose three definitions. By a *discipline* I mean an intellectual enterprise with a domain of phenomena, a body of data, concepts, and theories, and a set of techniques for gaining, validating, and applying knowledge. Neither the domain nor the techniques need be unique. Psychology and sociology alike study human beings, often in the same way, and economics possesses few techniques, and no general method, of its own. By *education conceived as a discipline*, I mean a field of study embodying the knowledge we use to structure and guide intellectual, moral, and emotional development. By a *theory of education*, I refer to a set of mutually consistent or coherent propositions derived logically or plausibly from assumptions about the proper nature and purpose of education. A theory of curriculum, for example, is a set of propositions about the kind of curriculum appropriate to the sort of education assumed to be desirable.

Why should we be concerned to establish education as a discipline? There are many reasons. First, to raise the standing of education as a study in the academic world, where, due largely to variable scholarship, it still is underappreciated. Second, to remind other disciplines of the educational importance of what they research and teach. Third, to remind educationists that their intellectual endeavor is as valuable as any other and conceivably the most useful of all intellectual endeavors. Fourth, to stress the importance of studying aspects of education that are not the central concern of other disciplines—aspects such as curriculum, instruction, control, and administration. Fifth, to clarify the changes in meaning that occur when concepts are imported into education from other disciplines...concepts such as "learning" from psychology, or "socialization" from sociology, or "production" and "consumption" from economics. Finally, to counter, or help to counter, public disillusion with schools of education and teachers and administrators generally. I realize that much of this disillusion is part of a general distrust of all public services, but much of it also originates in the uncertain status of educational studies.

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Some people doubt, and others deny, that education can be an autonomous discipline. They do not see how the subject matter of education can be unified, since so much of it comes from other disciplines with different aims, content and research methods. My reply is that all disciplines relevant to education are more alike than different, and it is the likenesses that count. Furthermore, no discipline is wholly autonomous. Psychology and sociology come together in social psychology; there also are psychohistory, psycholinguistics, and physiological psychology. Physics expands into biophysics, astrophysics, geophysics, and physical chemistry. A discipline is unified and autonomous to the extent that it can give direction to its subdisciplines while receiving information from them. Education not only takes from other disciplines; it gives to them. It will become more disciplined to the extent that it influences research and teaching in other disciplines through the knowledge it alone provides.

Critics also contend that the study of education is undisciplined because its subject matter is not organized hierarchically by means of theories and concepts indigenous to education. These critics assume that a discipline of education must model itself on mathematics and the natural sciences. But not even the human sciences, still less the humanities, possess anything like this degree of logical structure. Take the study of English, which encompasses an impressive array of subdivisions, including language, literature, composition, stylistics, and, very often, speech and communication. Does anyone doubt that English is a discipline? Yet its subject matter, like that of education, is loosely structured with no laws and very few theories that all its practitioners accept.

In recent years courses in education increasingly have been moved to the graduate or professional level, and for several reasons: (1) Many faculty members in other fields have raised doubts about the academic qualifications of education as a substantive discipline. (2) The heavy emphasis on practical pedagogy, characteristic of these courses, was not regarded as suitable to the undergraduate experience. And (3) education courses were taken almost exclusively by students intending to become teachers; they failed to appeal to undergraduates generally. It is a sad commentary on our profession, and on our subject matter, that we have been unable to include in the undergraduate curriculum the study of education as a substantive discipline and therefore have failed to interest the rank and file of students in a subject that is as important to them as any they take. Too many educationists have agreed with other faculty that, unlike standard subjects, education cannot profitably be studied by undergraduates generally. Too many members of our profession seem to have agreed with other faculty in the mistaken notion that education and pedagogy are synonymous. It is almost like saying that physiology and medicine or economics and management are one and the same.

The movement of education courses into graduate schools has left a vacuum that should be filled forthwith, if only for the fact that, unlike other professional studies, education increasingly has been ignoring the disciplines that are basic to it. Medicine draws on biology and chemistry; law, on ethics and politics; engineering, on mathematics; management, on economics. What disciplines are most basic to the study of education? They are the humanities: history, philosophy, literature, and certain aspects of cultural anthropology. These disciplines are most basic because education at heart is a normative, not a scientific, enterprise. It is concerned not just with the acquisition of

knowledge and skills, but also with principles of right action according to cultural norms.

True, many people speak of a "science" of education. If by this they mean empirical studies undertaken to determine what they think are the most effective ways to teach, design curricula, and administer schools, they may be using the term correctly. But if they mean the study of educational phenomena as if they were natural phenomena, the term is misused. Just think what a naturalistic science of education would be like. It would attempt to formulate laws and theories explaining, predicting, and controlling the educational process, not only in this country, but throughout the world. It would provide data that were precise, value free, and applicable everywhere. Yet can you imagine a time when all of us, let alone all the people of the world, will agree precisely on what education should be and do? Granted, natural scientists disagree among themselves, and the behavior of subatomic particles seems much like the behavior of human beings. They don't sit still long enough to be measured; their behavior so far is not entirely predictable; and every time you think you have nailed things down well enough to establish a law of subatomic behavior, the phenomena enter again into a new cosmic universe, and experimentation is renewed. Among natural scientists, however, most disagreements eventually are resolved by experimenting with phenomena that can be controlled and measured, whereas empirical evidence never will resolve the debate between those who believe in school prayer or school vouchers and those who do not. Their disagreement is not about scientific fact but about norms and values. Since, as I have said, education intrinsically is a normative endeavor, in that it seeks to realize ideals, and since ideals are matters of personal and social choice, education always will be subject to disagreement and controversy, and therefore never reducible to a naturalistic science.

What shall we say of the human sciences, especially psychology and sociology? After a hundred years of imitating the natural sciences, what can the human sciences offer to education? Not long ago, on the TV show "Firing Line," William F. Buckley gave Wilson Riles a list of 5 prime factors in any educational encounter: (1) skill of the teacher; (2) parental influence; (3) student intelligence and attitude; (4) learning environment; (5) student socio-economic environment. Buckley asked Riles to rate these factors on a 100-point scale according to their relative importance as determined by scientific research. Riles hesitated and asked for the question to be repeated. It was. After thinking for a moment, Riles said he could not rate the factors quantitatively. Why not? We do not have the evidence, he replied. And he was right. We do not. Think of it! After spending hundreds of millions to measure educational priorities, we still have no real answers. And we never shall. Quantitative research never will answer Buckley's question or the really pressing questions of education.

Despite prodigious efforts, human scientists have produced no universal laws or theories that are either scientific or precise. Instead, psychology and sociology offer only tendency statements, temporary generalizations, and ideosyncratic taxonomies, the fiduciary basis of which is both weak and elusive. Psychologist Lee Cronbach agrees with me. In the once fashionable field of aptitude-treatment interactions, Cronbach said he spent 18 years seeking stable interactions between instructional treatments and student characteristics. Finally, he told the American Psychological Association, "Once we attend to interactions, we enter a hall of mirrors that extends to

infinity." Any interactions Cronbach said he had identified soon changed along with changes in the social environment. Does it any longer make sense to look for laws? No, says Cronbach. "Taking stock today, I think most of us judge theoretical progress to have been disappointing. Many of us are uneasy with the intellectual style of psychology." He therefore proposed a more modest goal, to "seek insights into social relations and pin down the contemporary facts" in each generation. Instead of laws, then, we have insights; instead of theories, data. Now we educationists always can use data, provided we bear in mind the perspectives from which they were gathered. But if we want insights, I think I can show you better sources than either psychology or sociology.

Most people in education realize that the human sciences have failed to deliver on their promises. What bothers me is that these people seem untroubled by the relentless grip psychology exerts on educational thought and practice. Throughout the country legislators, swayed in part by educationists, make educational psychology a requirement for teaching licenses; they ignore history, philosophy, and other humanities. They seem convinced that for prospective teachers, the only source of reliable knowledge about human behavior, or the mind, or teaching and learning, is educational psychology. How long must we endure this charade? I recently glanced through some university catalogs and found that courses in educational psychology outnumbered all courses in history, philosophy, comparative education, and foundations put together. There isn't enough substantive knowledge in educational psychology to justify this disproportion, and what knowledge there is often can be found in more suitable form in the humanities. Psychology no doubt has yielded some useful information; but some theories, such as those of interest, readiness, transfer of training, social promotion, developmentalism, and discovery learning, may have done more harm to education than good, not only because the research supporting them was ill-conceived and poorly executed, but also because the theories themselves were not directly applicable or relevant to classroom teaching and learning. Psychology and sociology are of value to education only if the educationist first adopts a theory of education and then finds a school of psychology or sociology compatible with the theory. If you begin with psychology or sociology, as many do today, and read off what you think are their implications for education, you are lost.

Cultural anthropology is another story. It is the most fruitful of the human sciences for the study of education because it is an interpretative and descriptive science *par excellence*. Why do I say this? First, anthropologists use the method of participant observation. They look into the minds of those they study and seek to comprehend their view of the world. Their aim is to understand people, not to predict their behavior, much less to control it. Next, anthropologists explore education cross-culturally, both within nations and among them. In comparative education especially they investigate the aims, methods, and institutions of education as cultural emanations. Third, anthropologists examine education in its entirety, studying not only schooling, but also education by parents, peers, media, and other agencies, as well as both formal and informal learning. Fourth, and of special importance in this country, anthropologists give us valuable information about race and ethnicity. In our richly multicultural society educators and educationists must come to grips intellectually with an extraordinary array of cultural ideas, practices, and products.

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Finally, anthropology acts to correct psychological generalizations about, for instance, the alleged universal character of the development of the human mind as advanced by such as Piaget and Kohlberg with their sequential stages. The growth of the mind is seen by anthropologists as dependent to a large degree on particular cultural habits, demands, and language use acquired in early life. Critical factors in development of mind, therefore, cannot be universalized by applying the standards of a single culture, race, or socio-economic group, or even of Western civilization, much less by standards acceptable within the domain of psychological experimentation generally, but by the special situation of particular subjects in time, place and circumstance. I do not say that psychologists are unaware of the necessary impact of cultural environments and symbolic representations, as Howard Gardner's FRAME OF MIND testifies; but if psychology is to be of greater use to education, especially in a multicultural society, it must be supplemented by anthropology. Because, in my view, cultural anthropology is a human science of greater scope and meaning for education than either psychology or sociology, I would recommend, if I were an administrator and my budget were frozen, that offerings be decreased in psychology and increased in anthropology.

Any scholar wishing to understand his discipline must study its history. I have no time to discuss how different historians have interpreted the past, much as these interpretations recently have reached the front pages of our news media. Instead, I will make just two points. A knowledge of educational history will reveal that although styles change, along with ways of doing things, new and challenging discoveries of substance are likely to occur only infrequently. In education the lifespan of most innovations has been short, thus leading to Kneller's Law: "The more highly innovative the institution, the shorter the life of the innovations within it." We must bear in mind that any educational reform springs from tradition. The so-called "frontiers" of knowledge, the "breakthroughs" and "cutting edges" that we so often cite, always have a hinterland of preconceptions by which we determine, through critical experience over time, what has proved valuable and what has not. If history does nothing else, it provides us with that critical experience. My second point has to do with the present decline of interest in history *per se*, which may be due in part to its unfortunate dilution into social studies—unfortunate because the product is scraps of information too often lacking perspective or structure and resulting in a sacrifice of narrative form, continuity, and chronological development that characterizes history as an autonomous discipline. Seen from the perspective of education, which deals intimately with human reality and aspirations, history is a humanity, not a social study, and certainly not an empirical social science. After examining all kinds of research over many years, I am convinced that historical evidence is more relevant to the study of education than evidence from psychology or sociology. Again, however, this evidence is useful only if interpreted in the light of an educational theory, together with a compatible theory of history.

In both cases this theoretical understanding comes mainly from philosophy, which examines the foundations of all disciplines. There is philosophy of science, philosophy of religion, philosophy of mathematics, philosophy of psychology (very much needed), and, of course, philosophy of education. In all cases philosophy clarifies the concepts and assumptions these disciplines often take for granted. In the case of

psychology, for example, philosophy considers what the mind is, what an action consists of, and how thought and action are to be understood. Particular schools of psychology, and there are a dozen of them, assume they have the answers to these questions, and they press ahead with their research. But since, as philosophers have shown, the questions have not been answered, research findings often conflict and are confused. The classic debate between Rogers and Skinner shows how two psychologists argued from empirical evidence to entirely different conclusions, so that the debate came to turn on philosophical assumptions about what psychologists should be doing. In any research, whether educational or otherwise, the questions and hypotheses must be clearly conceptualized or the conclusions will be ambiguous and of no theoretical or practical use. In fact, they well may damage education and the life of knowledge generally. Philosophy acts to correct educational research by ascertaining, for example, how far a classification scheme is logically coherent, whether a generalization is empirically informative or tautological, and what form an educational theory should take. I know that some educationists tend to dismiss philosophy as impractical and elitist, but if philosophy did nothing more, its contribution to educational research alone would be testimony to its practicality.

Perhaps even more practical, and less elitist, is philosophy's relevance to test validation. I will cite a concrete example. In wide use today is a test for critical thinking composed by two eminent psychologists. It fails of its purpose, for neither the tasks nor the test results differ significantly from tests for general intelligence or examinations normally given to high school students to measure their assimilation of course content. Worse, the authors do not seem to know the difference between the truth or falsity of propositions as against the validity or invalidity of inferences. Thus in one exercise the test taker is told, "Examine each inference...and make a decision as to its degree of truth or falsity"—as if truth and falsity came in degrees as a result of logical inference. Again, the test fails to make the crucial distinction between questions that are self-contained and questions that require the use of information not in the questions themselves. Thus in one section the test taker is asked to judge whether each of a series of arguments is strong or weak. The questions are said to be self-contained, for the directions state, "Judge each argument separately on its own merit; try not to let your personal attitude...influence your evaluation." Yet both questions and arguments answering them are political and social. One question asks, "Should the US government take over all the main industries in the country, employ all who want to work, and offer the products at cost price?" The so-called "merits" of these arguments clearly depend on one's political views. Arguments that appear strong to a conservative will appear weak to a liberal and vice versa. In response, my own gratuitous recommendation would be that the test taker,faced with any such test, attack the questions rather than try to answer them, and thus more truly reveal a capacity for critical thinking. Now I am not saying that test validation is something only a study of philosophy can provide, but simply that a study of philosophy can be of considerable help, because its very substance is conducive to performing the task. May I add that since the whole business of educational testing has become the undeserved monopoly of psychologists, they should study more philosophy, or alternatively, make way for people in the humanities to take over what now intellectually is a faltering and not very productive enterprise.

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A third contribution of philosophy lies in the development of educational theories, for without theory you cannot justify practice. A philosophic theory may be prescriptive, outlining an ideal form of education. It also may be analytic or critical, enabling us to evaluate educational policies and outcomes. In generating theories philosophy has been fecund. Recently, for example, philosophy has given us a theory of education seen as initiation into worthwhile activities, a theory of curriculum based on clearly defined forms of knowledge, and a theory of the behavior of the educational system. A philosophic theory can be concrete and specific. In an article in the *Journal of Education* , Winter, 1983, Paolo Freire has given us a theory of the act of reading. He asks and seeks to answer: What goes on in a child's world during an act of reading? As an instance of philosophic phenomenology applied directly to an educational problem, you will find nothing more incisive or relevant. Again, if I were an administrator and my budget were frozen, and psychology courses outnumbered humanities courses, I would take from psychology courses and give to philosophy, thus making both the discipline and the practice of education more authentic and reflective.

Under any consideration I still would make room for courses in literature and education. The neglect of literature by educationists is incomprehensible. Like the historian, the philosopher, and others in humane studies, the creative writer gives us knowledge of how to live. The writer embodies knowledge of human beings and education in a tale that moves our imagination and emotions as well as our intellect. Writers make us see and feel what it is like to educate and be educated in different times and places. Charles Dickens, for example, portrays 20-odd schools and refers to several more. He also depicts a dozen types of coercion in child training. In *Women in Love*, D.H. Lawrence, a former elementary school teacher, gives us a riveting portrayal of a lesson seen by a school inspector. Especially since World War II education has become the central theme and setting of many novels. For portraits of teaching, learning, classroom interactions, and the joys and miseries of childhood and adolescence, we can do no better than study such works as Muriel Spark's *The Prime of Miss Jean Brodie*, John Horne Brown's *Lucifer with a Match*, Frances Patton's *Good Morning, Miss Dove*, Herman Wouk's *Marjorie Morningstar*, and many others I could name.

Literature extends our knowledge of education by enabling us to participate vicariously in other educational experiences than our own. Literature does this partly because it is itself the representation of experience and partly because it is expressed so vitally that it leads the reader to identify with the character or characters having the experience. Take this insightful passage from D. H. Lawrence's *The Rainbow* about young Ursula Brangwen as a student in an English School:

> So Ursula seated herself upon the hill of learning, looking down on the smoke and confusion and the manufacturing, engrossed activity of the town. She was happy. Up here, in school, she fancied the air was finer, beyond the factory smoke. She wanted to learn Latin and French and mathematics.... A Latin verb was virgin soil to her.... And when she knew that $x^2 - y^2$ equals $(x + y)(x - y)$, she felt she had grasped something, that she was liberated into an intoxicating air, rare and unconditional. And she was very glad as she wrote her French exercise: "J'ai donné le pain à mon petit frère." In all these there was a sound of a bugle in her heart, summoning her to perfect places. She never forgot her brown-colored *First French Grammar*, or her *Via Latina* with its red edges, or her little gray algebra book. There was always magic in them.

For us, too, there is magic in them, thanks to Lawrence's sensitive prose.

The opposite phenomenon—what it is like to teach a subject one loves to a class that is not interested—is splendidly captured in Bel Kaufman's *Up the Down Staircase*. The young teacher-narrator is idealistic yet able to laugh at herself. Thus she conveys both the joy and frustration of teaching. Take this passage:

> The trouble is, their utter lack of background. "I never read a book in my life," a boy informed me, "and I ain't starting now." It isn't easy to make them *like* a book.... The important thing is to make them feel King Lear's anguish, not a true-or-false test on Shakespeare.... I want to point the way to something that should forever lure them, when the TV set is broken and the movie is over and the school bell has rung for the last time.

I submit that this expression of a teacher's love of subject and the opposition it can meet is more succinct, more moving, and more true to life than anything written in the usual research paper.

Ezra Pound called writers the "antennae of the race." Often they reveal aspects of education that the educationist has ignored or misconceived. With their imagination, empathy, and verbal skill, writers invariably are more subtle, insightful, and yes, accurate than academic researchers. Evan Hunter's *The Blackboard Jungle*, for instance, tells us more about the causes and phenomenology of school violence than any sociological study I have seen. E. L. Braithwaite's *To Sir With Love* does the same thing for race prejudice. Through his integrity and understanding, a black teacher gradually wins the hearts and minds of his class of hostile white students, who ultimately learn from him as they do from no other teacher. Or take an episode from Irwin Shaw's *Rich Man, Poor Man*. Rudy's French teacher catches him sketching her in the nude. Asked to explain, Rudy replies that he is illustrating a construction he has just learned: "Je suis folle d'amour" (I am madly in love). The teacher, outraged, calls Rudy's father to school. The father stands up for his son. The drawing, he says, does not degrade the teacher but expresses the youth's normal sexuality. Where in the field of scientific research can you find an educational dilemma treated as sensitively as this? If students in education are looking for instant gratification, I would say they will get it by studying educational literature.

I have cited novels. Now let me read a little poetry. For D. H. Lawrence, students are not alone in their spirit of rebellion...against a school, a class, a teacher, or everybody. Here are some unusual but insightful lines on a teacher's rebellion against his students. The verses have a humor all their own.

> What does it matter to me if they can write
> A description of a dog or if they can't
> What is the point? To us both, it's my aunt!
> And yet I'm supposed to care, with all my might
> I do not, and will not; they don't and that's all!
> I shall keep my strength for myself; they can keep theirs as well
> Why should we beat our heads against the wall
> Of each other? I shall sit here and wait for the bell.

What teacher honestly can say he or she never has felt this sense of resignation? And shouldn't our students of education be asked to face up to the moods of surrender and helplessness that teachers so often are compelled to endure?

There are other forms of literature. The drama "The Crisis at Central High," for example, shows how a teacher in Little Rock, Arkansas, becomes embroiled in the 1957 showdown over integration in her high school. Every issue of this racial crisis is

debated passionately yet realistically, and the teacher herself becomes a model of courage and commitment in the face of mass hostility and resentment. Literature also includes biography and essays. You can reach into Gilbert Highet's *The Immortal Profession*, for example, and there find the inner nature of our mutual enterprise portrayed with such discernment and intuitive power as to cast a shadow on the usual academic attempt. I know that the human sciences are seeking accurate knowledge of education to replace what they regard as the impressionism of the humane studies. But as the decades pass and this goal recedes, it looks more like a mirage. So for knowledge that is reliable, memorable, and absorbing, for knowledge that touches the heart as well as the head, and for knowledge that increasingly should be a fundamental element in the discipline of education, we should turn to literature. If a benefactor were to ask me what chairs to endow for a department of education, I would recommend joint appointments in education and history, education and philosophy, education and cultural anthropology, and education and literature. Just think what such appointments would do for the prestige of education as a discipline or even for teacher education. Psychologists would face competition, for once. And if some, as I hope, went out of business, funds might be provided to retrain them for something more useful.

One benefit that should result from establishing a discipline of education is greater agreement on the essential content of a first or basic course, variously called introduction, foundations, or principles. The kinds of content and methods of teaching this course today are in a sad state of chaos, with results that have done little for the cause of education as a serious and stable disciplinary study. Some teachers treat the course as an orientation to the separate subdivisions and branches of education. Others use the problems or topics approach. In favor of both approaches is the fact that they help the student to choose the phase of education which he or she would like to study further. Against these and similar approaches is the fact that they do little to help the student see education as a whole. They seem to aim at an ever-moving target.

For reasons I have given, I would construct a first course out of content treated both in education and related disciplines. My ideal syllabus would comprise four main areas of education interconnected with aspects of the four disciplines I have mentioned. The areas would be education's relation to the culture and subcultures, educational control and administration, curriculum theory, and teaching and learning. The disciplines again would be history, philosophy, anthropology, and literature, together with selected information from the human sciences. I would start the unit in history to supply the background for the topics to follow, thus eliminating the need for historical data later. My second unit would focus on cultural factors introduced in the first unit. It would include educational aspects of such topics as acculturation, cultural change, and ethnicity, all treated largely within cultural anthropology. My third unit, drawing mostly on philosophy, would provide the skills needed to analyze concepts and arguments and appreciate the task of theory construction. It would be concerned especially with aims, values, and the constituents of knowledge. Units 2 and 3 could be interchanged. Unit 4 would center on human development, on the actions and aspirations of persons involved in education. It would treat theories of human nature as they bear on education, and would draw principally on philosophy, literature, and psychology. Topics would include the nature of intelligence, imagination, and creativity. Especially for students interested in teaching, it would deal with the profession of

education, its rewards and duties, its rights and responsibilities.

The four units would interlock. Literature, for example, would be treated in other units than unit 4. Problems of administration and control would be dealt with throughout the course. I would pay special attention to curriculum theory, which, more than any other area, justifies education's claim to be considered a distinct discipline. Through knowledge in this area, we can demonstrate that education is the prime and arguably the only discipline mainly concerned with what to learn, how to learn, and what it means to have learned something. It also is the only discipline likely to do justice to the vital role of education in social and intellectual life. For example, in her latest work *The Troubled Crusade*, Diane Ravitch gives a superb account of the crucial issues in American education since World War II, including the students' disruption of their own universities, the increased involvement of the courts in education, the fall in intellectual standards, and the ongoing struggle between the view that the prime task of formal education is to transmit a common body of knowledge and values and the view that education is a vehicle for social change. The chances of this remarkable book's ever being studied outside courses in education are slim. Yet it is one of the dozen or so books published in recent years with which students and faculty alike should be familiar, whatever their specialty, since they are all involved in education.

If undergraduates acquired nothing more, they would benefit from at least one course that explained in some depth what the intellectual experiences of their college careers involved. Most undergraduates seem quite ignorant of the many meanings of such terms as thinking, learning, knowing and analyzing. One question frequently asked by even my best students is, What is a concept? What does it mean to conceptualize? Many of you have experienced the incredulity with which even graduate students greet the news that there are half a dozen different ways of knowing and similarly of learning. My students never have failed to be impressed, for example, with Harry Broudy's essay "Mastery." It outlines some nine steps in the process of mastery learning, from mere repetition to the final step of creating new knowledge on the basis of what has been has been learned. This is light years removed from the study of learning in psychology.

I offer my syllabus simply as an illustration of the ideas I have presented this evening. Any syllabus, however, should take into account the reasons I have given for making education a discipline in its own right. It is painfully clear that while we are constrained to draw on other disciplines, we have come to depend on them too much. We have said, for example, that the best educational philosopher, psychologist, historian, sociologist is one who got his or her degree in the related discipline rather than in education. We have hired such people with little or no teaching experience at the pre-college level and slight knowledge of differences between their discipline and education. Yet when did you last hear of other departments appointing an educationist to their staff? We have a serious problem here: specialists in other disciplines are taking jobs away from specialists in education, and we remain complacent. I am a philosopher but I also am a worker and a businessman, and I am concerned about the fate of education both as a discipline and a profession. As such, I propose some sort of collective agreement, to the effect that all future appointments in education of specialists in other disciplines be contingent on a similar number of appointments of educationists in related disciplines. I have no hard data to prove my point, but I would

wager that with this agreement in force, places for over a hundred educationists would become available that now are awarded to interlopers from other disciplines.

Granted, my syllabus embraces a broad range of subject matter, but I see a first course as an overall introduction to the basics of a discipline of education rather than as a selection of topics limited by a particular teacher's academic preparation. To the shame of our profession, many teachers have built their syllabi around their dissertation topic, or special interest, or around material from popular paperbacks dealing mostly with problems of immediate and short-term interest. My syllabus may not appeal to such teachers, but for quality of content and intellectual rigor, it matches any syllabus in the university curriculum.

Again I must stress that the subject matter I propose is not limited to, or even geared toward, the preparation of teachers, any more than courses in sociology are intended to prepare social workers, or courses in English to prepare writers and journalists. The purpose of courses in the discipline of education is to provide knowledge and understanding of education and to challenge students of all specialities to think more deeply and more imaginatively about education as a highly desirable part of their academic experience. There would be an added benefit. Some excellent students not originally planning to be teachers might decide to become candidates, thus broadening the base for selection and consequently raising the quality of our teaching personnel. This broadened base becomes all the more important when we consider that in the next ten years, according to the State Superintendent of Public Instruction, California alone will need 150,000 more teachers.

One final question: Should undergraduates be allowed to major in education? I used to reject the idea on the grounds that majors in education were or would be studying something essentially professional rather than theoretical and academic. But I now am convinced that such a major, organized as a discipline in its own right, is as good an academic major as any, and is eminently suitable for those who lean toward no particular subject. For such students, as well as for others, a major in education would have lasting value, if only because most students become parents interested in the education of their children, all become payers of school taxes, and many vote on educational issues. If those who publicly are concerned with educational matters were to study education formally, in the manner described here, I believe the intellectul level of debate would rise appreciably, and so, presumably, would the standard of schooling.

In my opening statement I said that my message was especially timely today. It is timely because educational reform once again has become the talk of the nation, with all sorts of people getting into the act. I can conceive of no more auspicious occasion for concerted action. Your colleagues now will be more amenable to change, and you should approach them when their resistance is low. I do not claim that my proposal is a panacea, but I hope I have shown that it is at least a step in the right direction—toward the enhancement of education as a mature, responsible, and autonomous university discipline, not in any way less deserving, and in some ways more deserving, than disciplines already in the curriculum.

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NOTES ON A THEORY OF TEACHER EDUCATION

Robert E. Shutes

It has long been accepted in the philosophy of science that theory plays a critically important role in the generation of knowledge. It orders and makes sense of previous knowledge and research. It organizes and channels future research and allows the impact of research to cumulate. It enables prediction to become increasingly accurate and the statement of what is known to become ever more precise. Lacking theory, investigation is incoherent, proceeding by trial and error and testing unrelated hypotheses one after another. Since findings are discrete, knowledge cannot cumulate and a field of inquiry cannot advance.

Research on teacher education has so far been conducted without benefit of formal theory (Shutes, 1975). Indeed, such informal theory as has been applied to research in this area has mostly been limited to a particular area of interest such as micro-teaching or the function of early field experiences. Considering the complexity of teacher education and the widely held point of view that teaching is an art not subject to scientific analysis and explanation, some will certainly question whether teacher education should be researched at all and will assert that a philosophical position about the proper preparation of teachers will continue to be more useful than a theory. This paper springs from the opposite point of view. It rests on the belief that whatever part of teaching is an art, a major part is or can become a science that is subject to continuing refinement through empirical study and that is teachable in turn to new teachers. It also assumes that the preparation of teachers is too important to be governed by personal bias, by changing fashions, or by chance in the absence of a carefully developed rationale.

In keeping with that point of view, this paper examines some problems discernible in contemporary thought and research on teacher education and suggests a connection between those problems and the lack of theory. It then suggests the kinds of issues with which a theory of teacher education should be concerned. It is hoped that from this beginning the skeleton of a theory can be built and elaborated.

TEACHER EDUCATION DEFINED

Teacher education is a commonly used but vaguely defined term. For example, Peck and Tucker (1973, p. 942) noted in the *Second Handbook of Research on Teaching* that " 'Teacher education' is a long, complicated series of operations. Each operation is, itself, an extremely complex set of steps, most of which have never been carefully identified, let alone measured." Lanier (1982, p. 13) listed three conceptions of the effective teacher that have influenced research and the design of teacher education programs: the teacher as effective person, the teacher as skilled performer, and the teacher as professional decision maker. The three conceptions could be thought of as defining three major functions of teacher education. Smith (1982, p. 54) reported

that the University of Florida's PROTEACH Program conceived of three similar teacher roles: teacher as teacher, teacher as person, and teacher as professional.

From a different perspective, teacher education has been defined by contrasting it to teacher training. Teacher training, it is argued, prepares specialists in the practical details of the occupation, people who follow procedures and instructions specified by others without exercising much judgment about them. Teacher education, on the other hand, is said to prepare professionals to exercise independent judgment and make decisions appropriate to particular situations they encounter. Lanier (1982, pp. 21-23) has a very good discussion of the contrast.

Those who would define teacher education as a preparation program that emphasizes technical skills (planning, lesson design, classroom organization, and so on) would probably be satisfied with the goals associated with teacher training and would confine the study of teacher education to the pedagogical studies within the baccalaureate degree. They would likely argue that it would be impossible to reach higher goals within the limits of preservice teacher preparation. Those who would define teacher education as a program to prepare teachers for professional decision making as well as to exercise technical skills would probably see teacher education as embracing considerably more than pedagogical studies. Indeed, they would likely argue that teacher education cannot be completed within the baccalaureate or preservice program.

The fact is, of course, that we can prepare teachers in any way we want, to fill whatever roles we choose, at any level of competence we set. A good definition, then, should be sufficiently general to embrace all the possibilities and still set essential parameters. Such a definition would look something like the following.

Teacher education is a program of studies and experiences designed to prepare teachers:

a) to meet all the legal requirements for initial licensing, for later license renewal, and for higher level licenses required or sought;

b) to enable their pupils to achieve the kind of learning the society expects at or beyond the amount it requires;

c) to engender expected learning within a specified time frame at or beyond a specified level of success (e.g., a minimum level of mastery expected of all students and/or a minimum proportion of students reaching the expected mastery level);

d) to accommodate a specified range of individual differences among students while attaining the specified level of success;

e) to accomplish the learning goals without exceeding the societally set range of motivating and coercive behaviors;

f) to relate to students in the societally desired way so as to develop expected attitudes and values;

g) to maintain sufficient job satisfaction through experiencing personal and professional growth and success to continue an extended teaching career.

ISSUES A THEORY OF TEACHER EDUCATION SHOULD ADDRESS

There are three broad issues a theory of teacher education should address:

1) what effect different amounts, sequences, and combinations of content will have on the achievement of the purposes of teacher education specified in the definition.

2) what effect different delivery methods or experiences (e.g., lecture, laboratory, seminar, field experiences, simulations) and different student processing modes (e.g., reading, writing term papers, memorizing, observing, practicing, discussing ideas in small groups) will have on the achievement of the purposes of teacher education specified in the definition, and

3) what effect allocating different content, delivery methods, and student response modes to different stages in the career development of the teacher will have on the achievement of the purposes of teacher education specified in the definition.

One might have expected that a theory of teacher education would predict the optimum content, delivery, and response patterns to produce the best prepared teachers. That position is rejected in favor of the more general statements offered for two main reasons. First, the most effective content, delivery, and response patterns will clearly change for the same teacher at different points in his/her preparation and career, and they will also differ between teachers at the same level of experience. Second, since the same competencies can be developed by more than one curriculum and more than one methodology, there will never be one optimum way to prepare teachers at any stage in their careers. Rather there will be several ways to achieve the purposes of teacher education, each with different concomitant effects. It must be the objective of theory to predict the consequences of delivering different amounts, sequences, and combinations of content through different means and requiring different kinds of student responses at different stages in the teacher's career.

It is quite likely that when these several dimensions are considered together, some unfamiliar patterns of teacher education will be identified for experimental study. For example, research has repeatedly shown that teacher educators consider student teaching the capstone of the teacher education program and student teachers consider student teaching the most important part of their preparation (Davies & Amershek, 1969). On the other hand, research has also shown that cooperating teachers influence student teachers more than college supervisors do, especially in the teaching techniques that they adopt (Friebus, 1977; Karmos & Jacko, 1977). Still other research (Johnson, 1969) indicates that prospective teachers become more dogmatic as they get closer to student teaching. When these three findings are put together, they suggest that while the customary sequence of pedagogical content and the modes of delivery and response to it achieve some of the purposes of teacher education, they may subvert the achievement of others.

Perhaps if all or part of student teaching came early in the teacher education program and exposed students to the problems of teaching and to the customary

teaching and management techniques before they completed their professional foundation and special methods courses, they would better learn why certain teacher behaviors are more effective than others. Perhaps if the last influence on the behavior and beliefs of new teachers occurred in the reflective setting of the university rather than in the counterinfluential public school setting, more of the goals of teacher education programs would be achieved. Perhaps if clinic teaching were thought of as occurring at several points in a teacher's career, student teaching could be put in a quite different perspective. At any rate, considering the several dimensions of teacher education together in a theoretical framework allows new possibilities to be identified for both research and practice.

THE DIMENSIONS OF TEACHER EDUCATION

Teacher education programs have customarily been divided into a general or liberal studies component, a specialization component, and a pedagogical or professional component. The components have typically been thought of as occurring in that order, with liberal studies being accounted for in the academic foundations of the freshman and sophomore years, specialization dominating the junior year, and professional studies dominating the senior year (with some overlaps, of course). Generally, they have also been thought to be officially completed at the point of initial certification; any further study has been to some degree voluntary, has been mostly in the professional area, has only occasionally involved some further work in the old specialization or in developing another one, and has almost never systematically expanded the liberal studies.

Almost universally the purposes of each component have been only vaguely defined, and their definition has been tied to the specification of courses in the baccalaureate or other degree program. Indeed, it seems almost always to have been the case that each component's purposes have been thought to be achieved when the sequence of courses involved was completed, even though those purposes were never explicitly addressed or directly developed in any course. The effects of that assumption and possible alternative assumptions need to be carefully explored for all three components in a theory of teacher education.

The Liberal Studies Component

The content of the general or liberal education component has at times embraced all of the following: reading and writing skills, mathematics, biological and physical sciences, social sciences, humanities, and fine arts. The purpose of this component has at various times been said to be to develop broadly educated adults, to provide a breadth of knowledge on which depth of specialization can be built, and to provide the foundations to support professional study. Such purposes are open to multiple interpretations, so it would have been hard to determine whether they had been achieved even if anyone had tried. As recently as 1977, the Carnegie Foundation for the Advancement of Teaching declared the academic foundations to be a disaster area in most college programs. Their conclusion suggests that at present in most colleges and universities the academic foundations are not serving any purposes very well.[28]

Concern with the liberal education component does surface periodically in critical analyses of teacher education. For example, the Bicentennial Commission on Education for the Profession of Teaching of the American Association of Colleges of Teacher Education AACTE (Howsam, Corrigan, Denemark & Nash, 1976) listed general or liberal studies as a major component in the education of teachers. The Commission stated that "Liberal education for teachers should not be different from the liberal education of other students unless the differences represent extended opportunities for prospective teachers to explore the interrelationships of knowledge and their implications for teaching and learning" (p. 82). Although the Commission noted that "too often general studies are narrow, sketchy introductions to disconnected subjects with an overemphasis on nomenclature and classification systems," they did not recommend specific characteristics for liberal studies, and they only implied the purposes of those studies as they described a unique addition to the teacher education curriculum. This was incorporated in their recommendation that all prospective teachers participate in "an experience focusing on the nature and implications of knowledge" in conjunction with their general studies. They also recommended that this "*experience*" be taught by an interdisciplinary team and that students "consider alternative ways of knowing, unique structures of knowledge in different fields, linkages among concepts in the various disciplines, and the implications of these ideas for teaching at elementary and secondary levels" (p. 82).

Somehow the general studies are expected to provide the raw material from which the interdisciplinary *experience* will identify different ways of knowing, knowledge structures, and relationships between concepts. Although the appropriate general studies are not suggested, the proposed interdisciplinary *experience* is a concrete proposal to see that at least part of their purpose is accomplished. The Commission also named study in the undergirding disciplines of psychology, sociology, anthropology, and philosophy as a major component of the education of teachers that should be prerequisite to professional studies. Since these disciplines are not part of the specialization or professional component, they can be thought of as one specified part of the general studies component.

Another example of periodic concern for the liberal education component is the May-June 1980 issue of the *Journal of Teacher Education*, in which *the liberal education of educators* is the theme. In that issue six scholars (Carbone, 1980; Ducharme, 1980; Freeman, 1980; Herson, 1980; Raths, 1980; Rich, 1980) discussed the difficulty of defining liberal education, the generally sorry state of liberal studies at present, and the near impossibility of specifying which subjects or courses are essential to develop liberally educated people. They were unanimous in their conviction that a liberal education is important for all educated people and particularly for teachers, and they were generally agreed (at least implicitly) that a liberal education is developed during the undergraduate program, especially during its first two years. Rather than specifying specific courses, most of them addressed the purposes the liberal studies should serve, and some gave examples of disciplines that would contribute to those purposes. Table 1 displays the purposes proposed by four of these scholars; although the language differs from one to the next, several similarities in intent are easily perceived.

There are three important inferences one can draw from these discussions of the

liberal studies component. First, although the language still lacks precision, there appears to be an emerging consensus about the purposes that these studies should serve. Second, there is general agreement that, as presently implemented, the academic foundation requirements do not do very well in achieving those purposes. Third, in terms of teacher education, there is an unnecessary assumption that these purposes can and should be mostly achieved by the end of the sophomore year and completely achieved by the end of the senior year.

The first inference suggests that with attention and effort it ought to be possible for any institution of higher learning to specify the purposes of the liberal education component with sufficient precision to design a curriculum to achieve them. Such an effort would obviously require widespread involvement and cooperation among representatives of many disciplines to assure that all courses in all disciplines that are to be part of the liberal studies component serve the purposes defined for that component. At present, for example, most courses in the academic foundations focus on the transfer of information, but the purposes of the liberal studies suggested in Table 1 focus more on developing processes and intellectual skills. The second inference implies that the curriculum should be built to accomplish its predetermined purposes instead of to accommodate existing courses, departments, and disciplinary orientations toward serving the development of specialists. It suggests that the delivery system must be drastically changed and improved in order to achieve its purpose. The third inference suggests that the liberal studies component of teacher education could be continued just as legitimately and importantly as the specialization and professional components throughout a teacher's career.

A theory of teacher education should allow one to hypothesize about a number of issues related to the liberal studies component. Some examples would include:

- what purposes the liberal studies can most effectively serve;
- which disciplines could contribute most directly to achieving the purposes of the liberal studies;
- which kinds of content (e.g., concepts, generalizations, examples, processes, modes of thought) within disciplines would best facilitate the desired learnings;
- which combinations and sequences of content, within and between disciplines, would best facilitate the desired learnings;
- whether it makes a difference in level and quality of student learnings if the instructors in all the liberal studies courses are made aware of the purposes the set of courses is to serve;
- whether it makes a difference in the level and quality of student learning if the instructors in all the liberal studies courses participate in planning and monitoring the liberal studies program;
- what kinds of effects different forms of content, different experiences, and different response modes have on the achievement of program goals;
- which purposes of the liberal studies fit best at different career development levels.

Table 1

PROPOSED PURPOSES OR GOALS FOR LIBERAL EDUCATION*

John Martin Rich University of Texas at Austin	Laurence J. R. Herson The Ohio State University	James Raths University of Illinois, Urbana-Champaign	Peter F. Carbone, Jr. Duke University
Concern for key questions rather than for fixed content is characteristic of liberally educated individuals.			
One or more generic modes of inquiry should be selected for application to the problems under consideration:	The curriculum stresses four capacities all dealing with connections:	As a result of general education students should:	The focus ought to be on:
a) The analytical mode (e.g., math, logic, metaphysics, epistemology, theory construction); b) The empirical mode (e.g., studies in the natural and social sciences); c) The valuational mode (e.g., aesthetics, ethics, some religious studies, and aspects of economics).	a) an ability to connect argument and evidence with conclusions (the traditional meaning of logic); b) a capacity for understanding relational, affective, or deterministic processes (an appreciation of theory building); c) an ability to judge which arguments and which data are most fully supportive of the conclusion; d) an ability to connect and compare some designated work (poem, opera, laboratory finding, architect's drawing, public opinion poll . . .) with an accepted judgmental canon (in short, the skills of the critic).	a) be aware of and concerned about the ways in which information is generated and tested; b) be sensitive to the distinction between findings and the explanations for findings; c) recognize that while many explanations may be advanced to account for certain phenomena, some may be better than others.	a) the structure of knowledge, b) principles of explanation, c) nature of verification, and d) methodological strategies and techniques in a given field rather than on subject matter, though some familiarity with the latter is obviously a prerequisite for this approach.

*Taken from articles by the four scholars in the May-June, 1980 (31:3) issue of the *Journal of Teacher Education*. Sequence and format have been altered to allow similar ideas to be shown in somewhat parallel positions.

Area of Specialization Component

As in the liberal studies component, the purposes of the specialization area have also been left in rather vague terms. Language such as "to build depth in the subject," "to engender command of the field," or "to assure that the teacher knows more about the field than is required in the public schools" does not tell us how we shall recognize "depth" or "command" or "more than is required." More often than not, the intent gets translated into some required numbers of credit hours, with the minimum acceptable number varying from field to field, from institution to institution, and from state to state. Certain courses are specified within the required hours, but several elective options are usually provided. Therefore, even within the same institution, students with the same specialization may not have the same courses or pursue the same goals.

Customarily, the only qualitative criterion applied to the hours required for the specialization is a grade point ratio set somewhere between 2.00 and 3.00 on a four point scale. Rarely has anyone asked what the prospective teacher should learn in those hours—what knowledge of the structure of the field, what key concepts and generalizations, what skills and processes, what abilities to explain, to illustrate, to translate into simpler or more sophisticated terms. Until recently, it has been rare for anyone to ask for measures of learning in the specialization in any form other than course grades. Although the specialization area is being included in some of the developing programs of teacher competency testing (Sandefur, 1984), there is no evidence that such tests go beyond factual information or reflect a well rationalized point of view about all the things a competent teacher should know about his subject to teach it well. Thus, even though students take identical courses, if they take them in different semesters or with different instructors, their learning within their specialization may differ substantially; if they take different courses, it will be substantially different. Unless the competency tests are based on a much clearer and more widely adopted theoretical position on what competencies the specialization area should produce, such tests will inevitably become measures of minimum familiarity with minimum quantities of low-level facts.

Several possible purposes for the specialization component can be considered. A basic purpose could be to give the prospective teacher command of all the content in that subject he or she might ever be called upon to teach in the public schools. A broader purpose would be to acquaint the prospective teacher also with the college level content in that subject for which the public school level content would be prerequisite (to give the teacher, in other words, a perspective of the sequence of the field and an understanding of where the content he or she will teach fits in that sequence). A quite different purpose would be to build in the prospective teacher an understanding of all the dimensions of the specialization regardless of where they would be encountered from kindergarten through graduate school. It could also be a purpose of the specialization to provide the prospective teacher with a knowledge of the history of the field and its development or with an understanding of all of the uses of its content.

A quite different way of thinking of the purposes of the specialization component considers its function in the general development of a teacher. For instance, one could propose that the purpose of the specialization is to give the teacher awareness of the

nature and functions of expertise and/or of how it is built and of what satisfactions it affords its possessor. This would apply to elementary teachers who are responsible for many subjects (possibly not including their specializations) as well as to secondary teachers who do in fact teach their specializations. Developing an understanding of what special insights expertise provides allows one to put other areas of less developed knowledge in a more humble perspective. It also can encourage higher aspirations for personal accomplishment, greater respect for knowledge, and more insistent reference to facts in responding to opinion or claim. These could also be adopted as purposes for the specialization in their own right, and their effect on the thought, the belief, and the behavior of the prospective teacher can be hypothesized and investigated. It should be noted that the purposes discussed in this paragraph are not incompatible with the more pragmatic purposes listed first.

Not only are there different possible purposes for the specialization component, there are also different ways of expressing those purposes. For example, in the sample purpose statements given in the preceding paragraph, there was reference to public school level content and to college level content. The term content could be replaced by facts, concepts, generalizations, processes, and modes of inquiry and so made more precise. The term public school content could be replaced by more exact descriptors, such as arithmetic, algebra through equations with 3 variables, plane geometry, and trigonometry and similar substitutions could be made for college level content. A theory of teacher education should be concerned with the effects of using different kinds of language to express the purposes of the components of teacher education on the achievement of those purposes.

There is a further question of whether the individual instructors in the courses taken for the specialization component are aware of the purposes adopted for the specialization and consciously and explicitly seek to advance those purposes in their instruction. They may be totally ignorant of the fact that the designers of the specialization component (even if they included representatives from the specialization) adopted the purposes in the first place. They may or may not agree with the purposes; they may even consider the purposes irrelevant in the context of their discipline. They may also accept the purposes but not attempt or not know how to make their instruction serve them. Given the realities of operation on most college and university campuses, it is likely that few of the instructors who teach specialization courses even suspect that the specialization is intended to accomplish some overall goals, especially goals related to teacher education. Consequently, if those goals are served at all, it is mostly by chance. A theory of teacher education should predict the consequences of different levels of instructor awareness, acceptance, and pursuit of general purposes for the specialization.

Beyond the purposes for the specialization, there are questions about its optimum scope, sequence, and configuration for theory to address. There has been debate for years over how many semester credit hours should be required in the specialization, though requirements have rarely been made beyond those for the initial certificate. Furthermore, despite considerable variation in the number of hours required in the specialization, significant positive correlations between the number of hours taken and a wide variety of measures of teacher effectiveness have rarely been found. Neither has any consistent relationship been established between grade point average in the

specialization and teacher effectiveness. Though common sense would suggest that teachers who know more about their subject should be able to teach more of it to their students (i.e., they should be more effective), the fact that these gross measures of their knowledge do not correlate significantly with any measures of their students' achievement indicates that we have been asking the wrong questions about the relationship.

Since the amount of the teacher's knowledge in his or her specialization that can be taught in any one year to public school students is relatively small, perhaps the extent of the teacher's knowledge is not the critical factor. Maybe instead it is more important for the teacher to have personally organized that knowledge—for example, into categories of more and less important; into related clusters or hierarchies; into sets of facts, concepts, and generalizations; into sets of principles and supporting examples; into categories of more interesting and less interesting, or more useful and less useful, or still some other organization. Maybe it is more important whether the teacher can construct a semester's course or a year's course in his or her specialization at the appropriate level of difficulty and with the appropriate amount of variety to fit the developmental level of the students and do it without reference to an existing textbook than it is how many semester hours the teacher has completed in the field or what grades were earned. A theory of teacher education should explore such alternatives.

No research studies and no conceptual statements have been found which are concerned with how work in the specialization should be sequenced for optimal effect. Some courses in every field are declared to be prerequisite to others, but they are relatively few at most institutions and the prerequisites are often waived by the instructor. It would be useful to know whether a carefully designed *sequence* of experiences would prepare teachers with a better sense of structure in their discipline, with better skills, and with more effective teaching strategies than teachers who took a more or less random sequence of courses. Similarly, it would be useful to know whether certain configurations of courses in the specialization—introductory courses, survey courses, laboratory and application courses, critical assessment courses, special topic courses, and so on—would produce more effective teachers than alternative configurations. This leads, in turn, to a consideration of the effect that different kinds of learning experiences within courses and configurations of courses may have on the later performance of the teacher. These are also questions that a theory of teacher education could pose and explore, and that exploration should consider the effect of completing part of the specialization component after initial certification.

Professional Studies Component

The professional or pedagogical studies have long been considered essential to the preparation of teachers (see, for example, Ryan, 1975). Indeed, Corrigan (1982, p. 38) asserted that "... nothing should obscure the fact that the difference between an educated person and a professional teacher is pedagogy—the science of teaching." Although among professionals there is a strong consensus on this point, there has been anything but consensus about what content and experiences the pedagogical studies should contain. In implicit recognition of this disagreement, Corrigan (1982, p. 38) argued that a profession "... must possess a clearly defined common body of knowledge, values, and a repertoire of skills essential to professional practice ..." and

then asked "How can we get the teaching profession and its training arm to identify, accept and teach a common body of knowledge, skill and professional values essential to the practice of teaching?"

Howsam et al. (1976, pp. 86-91) proposed seven categories of objectives for the education of teachers: 1) theoretical and empirical knowledge (including the foundations), 2) humanistic educational attitudes and values, 3) a repertoire of teaching behaviors and skills, 4) systematic induction into the profession, 5) the personalization of teaching style, 6) awareness of professional issures and concerns, and 7) continuing inquiry and development. It is significant that they did not think of teacher education as concluding with initial certification. Smith (1982) described the professional component of the University of Florida's PROTEACH programs as including 1) a foundational education segment including educational psychology, tests and measurements, and history and philosophy of education; 2) a generic pedagogical segment which deals with general knowledge and skills appropriate for all teachers; 3) a subject-specific pedagogical component which deals with specific knowledge and skills appropriate to teaching a particular age level or subject, and 4) a clinical and laboratory segment. Both of these delineations of the professional component are very similar to delineations proposed or implemented in the past, although they both challenge to some degree the way these dimensions have been treated previously.

The thrust of the discussion in the Bicentennial Commission report (Howsam et al., 1976) indicates somewhat more concern with the purpose of each aspect of the professional component than has been true in the past, but the purposes expressed are still typically general and occasionally vague or obscure. In order for the effect of these aspects of the professional component individually and of the component as a whole to be properly evaluated, their purposes need to be clarified and amplified.

Both the Bicentennial Commission Report (Howsam et al., 1976) and the Florida PROTEACH Program (Smith, 1982) gave some attention to the content to be delivered in the professional component and to the method of that delivery, though neither was exhaustive on these matters. Moreover, both assumed the validity of their recommendations rather than taking an experimental attitude and planning to compare the results of using different content, methods, and student responses. The Bicentennial Commission (Howsam et al., 1976, p. 86) named six categories into which instructional modes could be grouped: 1) classroom, 2) learning resource center, 3) laboratory, 4) field, 5) model, and 6) mentor, but other than declaring that teaching methodology should be exemplary in teacher education programs, the Commission did not specify what methods would produce best results for each part of the professional component. They said nothing about the kinds of student response modes that might make instruction more effective. Predicting what effect different kinds of instructional modes and student response modes would have on the achievement of the various purposes of the professional studies component is something a theory of teacher education should be concerned with.

These two contemporary delineations of the professional studies component are representative of many concerns from the past. Indeed, patterns in the professional studies component have tended to evolve in two ways. First, some content has remained rather stable while the delivery methods for it have frequently changed. Generic teaching methods would be a good example of stable content, and pro-

grammed instruction, televised instruction, peer teaching, microteaching, demonstration teaching, and various other methodologies would illustrate changes in the delivery system. Second, some content has changed repeatedly (sometimes even disappearing and reappearing) while the methodology has remained rather stable. The educational foundations, for example, have waxed and waned, having been abandoned from time to time because they were perceived as too theoretical and irrelevant by undergraduates, and having been resurrected at other times because teachers without knowledge of them lacked perspective, a sense of history, compassion for students, and other marks of professional teachers. Each time they have returned to the curriculum, however, it has been largely in the same form as before (namely in self-contained, disconnected, discipline-focused courses) and that has led to the same problems.

It is noteworthy that Howsam et al. (1976, pp. 87-88) expressed considerable dissatisfaction with the way the educational foundations have been taught in the past and recommended significant changes in the formats, conceptual frameworks, and delivery modes of the undergirding disciplines. It is rather surprising, however, that they did not explore the possibility of incorporating those foundations in the inservice as well as the preservice preparation of teachers. It is also disappointing that they got no more specific about how they should be taught than to ask their instructors to be "experimental in teaching procedures and delivery modes" (p. 88).

Lacking a theoretical framework to design, to evaluate, and to research alternative content, methodology, and student response modes in the professional studies component, teacher educators have been more driven by fads and frustrations than by rational or empirical sources. Many alternative definitions of scope, sequence, and the configuration of content could be investigated, especially if this component were thought of as beginning in the preservice education of teachers and extending through several stages in their careers. Similarly, a variety of methods of delivering the content and of involving the students in responding to it could be investigated to determine which ones best achieved the purposes identified for this component at different career stages.

SUMMARY AND IMPLICATIONS

The foregoing discussion has attempted to show that without a theoretical framework teacher education and research on teacher education have not developed a demonstrably superior and improving program or cumulated a meaningful body of empirical rather than experiential findings. Without trying to propose a theory of teacher education as such, it has suggested several matters in teacher education that a theory could address. It has even sketched the beginnings of a framework within which previous research could be organized and further research could be designed. As a means of suggesting next steps in the development of a theory of teacher education, a few implications of the preceding discussion are drawn below.

The first step in the development of a theory of teacher education appears to be to state a set of overall purposes for teacher education explicitly and completely. If in deriving the general set it appears that alternative sets are possible, the alternative sets should also be specified. Next, in the light of the general purposes, the presently

conceived components should be evaluated to determine whether they support the achievement of the general purposes better than alternative components or alternative ways of describing those components could. When a set of components has been selected as optimum, the purposes of each of them need to be fully specified. That, in turn, will allow the investigation of content within each component in terms of its contribution to the achievement of component purposes and general purposes.

The content of all components will need to be examined for its quantity, specific selection, sequence, combination or configuration within and across subjects, and its distribution across career stages as shown schematically in Figure 1. The amount of content should be stated in terms of major categories of concepts, generalizations, processes, skills, modes of thought, and the like rather than in terms of semester hours or proportion of a program. Within the major categories, alternative selections of the content itself can be specified and a set of hypotheses developed about the effect of using each set. Similarly, alternative sequences and combinations of content can be deduced and hypotheses can be generated about their effects. Finally, alternative distributions of the content across preservice and later career stages can be considered and hypotheses can be built about their effects. Figure 2 suggests some changing configurations of content across components at different career stages.

Several possible career stages are shown in Figure 2. Preservice and beginning teachers are to a considerable degree dependent on the supervision and guidance of others. Around the fourth or fifth year of service, when full certification is to be granted, it is expected that a professional teacher can function independently, and once

Figure 1

CONTENT DELINEATION

	Liberal Studies Component	Specialization Component	Professional Studies Component
Amount			
Specification			
Sequence			
Combination			
Distribution			

independence has been well established, it usually occurs that professional teachers become specialists in certain professional roles. For example, they supervise student teachers, they teach classes of handicapped or problem or gifted learners, they participate in experimental programs, or they become curriculum developers. The supervising/demonstration teacher is conceived of here as the one to supervise beginning teachers and to serve as a model in the use of certain teaching methods, classroom organizations, or instructional support systems. The master teacher assumes organizational and managerial responsibilities related to the design and delivery of the instructional program, serves as a guide and stimulus to the personal growth of junior teachers, and takes leadership in establishing the climate and ethos of the school. Other stages and roles could easily be conceived.

At each of these stages a different mix of liberal studies, academic specialization studies, and professional studies (or other identified components) is seen as appropriate

Figure 2

CHANGING CONFIGURATIONS OF CONTENT AT DIFFERENT CAREER STAGES

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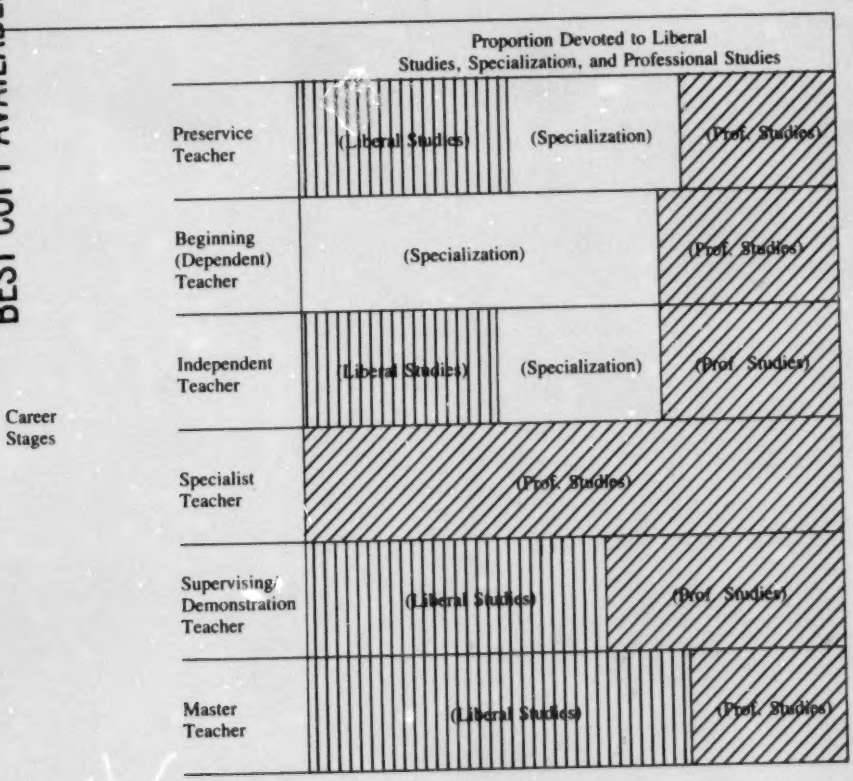

Table 2

SPECIFIC DIMENSIONS OF INSTRUCTION*

Locus of Delivery	Mode of Instruction	Instructional Behavior	Elicited Student Response	Form of Student Response
College Classroom	Lecture	Informing	Listening	Oral answer
College Lrng. Resc. Center	Discussion	Defining	Reading	Notes
College Laboratory	Dialogue	Explaining	Recording	Outline
College Library	Mediated presentation	Explicating	Responding	Reaction paper
College Office	Computer delivered presentation	Simplifying	Memorizing	Position paper
College Computer Center	Simulation	Evoking	Translating	Research paper
School Classroom	Reading assignment	Questioning	Applying	Test
School Lrng. Resc. Center		Probing	Analyzing	Oral presentation
School Laboratory	Demonstration	Evaluating	Synthesizing	Demonstration lesson
School Playground		Guiding	Evaluting	Trials
School Library		Modeling	Practicing	Role assumption
School Office		Advising	Performing	Microteaching
Sch. Tchr's Office or Conf. Room		Critiquing	Comparing	Leading a group
Community Meeting		Correcting	Relating	Teaching, Supervising
Board of Education Meeting		Confirming		

*Note: There is no attempt to relate visually the entries of the different columns by placing them at similar positions in the column.

to support the new roles being undertaken. It should be noted that the space devoted to each component represents the *proportion* of the total study devoted to it rather than absolute amounts of study, which will change from one stage to another. It should also be noted that none of the components is thought of as completed before mid-career, and research may well establish reasons to continue study in all components in varying proportions throughout a teaching career. Clearly, however, the nature of the appropriate content, of its delivery, and of teacher responses would need to change from one stage to another.

The final aspect of teacher education with which theory must be concerned is the instructional process. Five distinct dimensions of instruction that may influence outcomes have been identified or suggested at various points in this paper: 1) where the instruction takes place—its locus of delivery; 2) the mode of delivery; 3) the specific teacher behaviors and objectives; 4) the kinds of student responses elicited by the instruction; and 5) the form that the student responses take. Table 2 suggests the kinds of entries that might belong in each of those dimensions without trying to be exhaustive.

Obviously, there are more instructional possibilities than could be investigated in any one research study, and probably more than a theory would address. Once the purposes and content for teacher education have been laid out, however, it will be possible to match selected instructional dimensions to them for investigation and to hypothesize the effects of making different choices. That way the size of the research task can be reduced and the shape of the theory can begin to emerge. Along the way, some terms will have to be defined, some postulates will have to be framed, and some relationships will have to be predicted on the basis of past and cumulating research. A theory of teacher education will not spring full grown from anybody's head, but by identifying the theory's dimensions and parameters, we can quickly make conceptualizing and researching in teacher education more fruitful.

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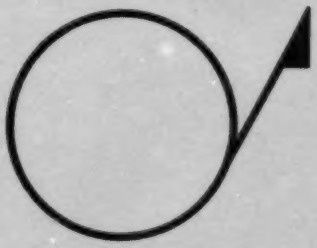
Section II Curriculum



RESEARCH-BASED TEACHER EDUCATION

William H. Peters

To paraphrase Charles Dickens, it is the best of times and it is the worst of times for educators. It is the best of times because education is at last receiving the careful consideration of both the politicians and the public needed to provide support to carry out its tasks; it is the worst of times because education is receiving criticism much of which is undeserved and over which it has little control. However, it is within the context of such times that much can be achieved both by public schools and by institutions concerned with teacher education.

TEACHER EDUCATION

Teacher education experiences include the program features and student teaching experiences provided in teacher education programs. As one reviews more recent literature in teacher education, it becomes clear that a predominant theme is the need for any quality teacher education program to provide a pedagogical component that emphasizes generic teaching competencies. For example, Howsam, Corrigan, Denemark, and Nash (1976) used the term professional culture to designate the knowledge, skills, behaviors, attitudes, and values that make up the collective basis for practices and decision making by members of a profession. A paper which evolved out of the experiences of the Dean's Grants Projects contains a substantive discussion of and recommendations for competency clusters or domains which are derived from Public Law 94-142 and which define a common core of requirements or a professional culture for all teachers. Lindsey (1978) described generic competencies essential to teaching any curriculum to any age group in any setting. Denemark and Nutter (1980) proposed seven generic teaching competencies not unlike those competencies identified by B. O. Smith (1980).

A recent attempt to incorporate a knowledge base into the preservice programs of teacher education has taken place at the University of Florida through its *Pro-Teach Project*. The generic pedagogical component of the *Pro-Teach Project* divides the roles and functions of the teacher into three areas: (1) teacher as teacher; (2) teacher as person; and (3) teacher as professional. Each of these areas is subdivided into content areas. For example, teacher as teacher has five categories: (1) diagnosis; (2) instructional planning; (3) instructional management; (4) observation; and (5) interpersonal relations. Each of these areas has appropriate knowledge and behaviors specified and each is validated by a research base. The most comprehensive description of the knowledge base for teacher education in the profession is the *Florida Beginning Teacher Program*, Florida Teacher Education Certification and Inservice Development Department (B. O. Smith, 1981). Special use was made of research on teachers' pedagogical judgment, plans, and decisions as developed by the Rand Corporation with the support of the National Institute of Education and of the work of Brophy (1978) on Classroom Organization and Management.

To upgrade the education profession, the American Association of Colleges for Teacher Education (AACTE) and the National Education Association (NEA) have described ideal frameworks for initial teacher preparation programs. Howsam et al. (1976) organize the generic teaching knowledge and skills common to all teaching experiences and useful in every subject field, grade level and student population into types of categories and consider them in relation to stages of the teaching act. According to these writers, preactive skills are those used by the teacher in planning for the actual teaching activity. Interactive skills are those used by the teacher in the actual conduct of class activities. Other active skills are those that either bridge the first two categories (e.g., evaluation) or demand proficiency in dealing with others. To stimulate significant improvements in the quality of instruction, the NEA's document *Excellence in Schools, Teacher Education: An Action Plan* (Robinson, 1982) focuses on major functions of teaching in the classroom: (1) facilitating learning; (2) managing the classroom; and (3) making decisions. These functions are considered as essential for successful practice and are recommended as the basis for the design, development and implementation of college programs. A sample of teacher actions is provided under each of the functions.

Teacher education institutions, then, are beginning to incorporate into preservice programs the social science research literature associated with teaching and learning to support their programs and to validate theoretical frameworks being constructed for initial teacher preparation programs.

TEACHER PROPERTIES

Teacher properties consist of the measurable personality characteristics which the teacher takes into the teaching situation. The personality and teaching style of the teacher, whether contrived or spontaneous, appear to influence the environment to which the student is responding and adjusting, and what transpires in the classroom between the teacher and student is apparently influenced to a great extent by the teacher. McKeachie, Isaacar & Milhall (1964) found such elements as a sympathetic attitude and self-reliance as important teacher behaviors when dealing with situations in which a teacher attempts to communicate with students. Analyzing taped discussions, Taba (1964) made it evident that the teacher's behavior has enormous influence on the thought processes of students. Alexander and Elson (1971) studied the effects of teacher-initiated personal interactions on the achievements of students, and findings from this study emphasized the importance of affective teacher variables for student learning at higher levels. Harris (1973) found that students taught by a teacher who modeled flexible, divergent, or creative behavior increased in creative behavior more than students with teachers who did not provide such modeling. Experimental studies of questioning by Ward and Tikunoff (1975) and by the Stanford Program on Teaching Effectiveness (1976) found that students who were in classes where more recall questions were asked did slightly better on recall tests, yet students did equally well on integrative questions regardless of what percent of recall questions were asked in class. In a similar vein, Wright and Nuthall found significant positive results in student responses when teachers exhibited a probing behvior (1970); yet Brophy and Evertson

did not find a relationship between seeking improved responses and achievement (1976).

In order to investigate the effects of teacher characteristics on pupil achievement, observation of actual instances of instruction in the classroom becomes paramount. Techniques for measuring classroom behaviors began to be available when Medley and Mitzel (1958) published the Observation Schedule and Record (OScAR) and when Flanders (1960) published the initial findings of his Interaction Analysis Categories system (FIAC). Rosenshine (1976) reports that the work of such individuals as Flanders, Medley, and Mitzel ushered in the modern era of studies on teacher effectiveness. Even in this modern era only a limited number of studies which investigate the relationship between classroom instruction and student achievement has been conducted and the number of researchers involved is equally small.

GRADE/SUBJECT DIFFERENCES AND TEACHER EFFECTIVENESS

That any quality teacher preparation program will provide a pedagogical component that emphasizes generic teaching competencies seems to have been recognized and accepted in most of today's educational circles. However, we must be mindful of the points that Medley (1979) makes when he suggests that any given teacher competency may be used only under certain circumstances or contexts and when he suggests that we must take into account not only how teachers behave, but when and why they behave as they do as we conduct research into teacher competencies. Soar and Soar (1983) provide us with the same type of caution when they suggest that for all pupils and for all objectives, no single type of teaching is best. Medley (1979) points out that one important unanswered question concerning the nature of teacher effectiveness is whether a teacher who effectively produces one kind of gain with one kind of student will also effectively produce other kinds of gains with other kinds of students. For example, Brophy and Evertson (1974) found that many tests of indirectness at the primary grades failed to produce a relationship with achievement while studies at the higher grades did yield relationships with achievement. Evertson, Anderson, and Brophy (1978) found little support for direct instruction in English classes, yet teacher effectiveness research conducted in the elementary grades support using the direct instruction format, particularly for basic skills learning. Soar and Soar (1983) point out that consideration of context variables will lead to different recommendations for the best teaching practice, and include among their recommendations the following: teacher control of learning activities should vary, with less control for high-cognitive-level achievement [and] complex problem solving; higher structure is best for low-cognitive-level outcomes. It would appear that in addition to research-based generic teaching competencies as part of a teacher preparation program, serious consideration also must be given to researching appropriate teaching styles to fit the needs of the various disciplines.

Two seminal research studies conducted with college freshmen in English classrooms suggest the type of research which may address the cautions suggested by Medley (1979) and by Soar and Soar (1983). The conception of reading response as a complex process includes an emphasis on reasoning and on judging as essential

elements in reading. The teacher of literature attempts to improve the individual's capacity to evoke meaning from the text by leading him to reflect self-critically on this reading process and to be open in response to the literature. The first research study by Peters and Blues (1978) focused its attention on the effect of one teacher characteristic, preference for complexity and tolerance to ambiguity as measured by the *Co Scale* of the *Omnibus Personality Inventory* (1962), on student achievement in response to literature. It was the purpose of this study to see if a significant relationship existed between the tolerance to ambiguity and preference for complexity in English teachers and student response to literature.

In order to analyze this problem, the following question was investigated:

> If teachers are randomly selected from a group who score High on the *Co Scale* of the *OPI* and if teachers are randomly selected from a group who score Low on the same scale, will there be a difference between the two groups in the effect they have on the achievement on the Written Response to Literature Test of freshmen college students who scored High or Low on the *Co Scale* of the *OPI*?

The measure of perception called complexity—Co, is related to an open, creative approach to phenomena and is a measure of intellectual disposition or orientation. This measure of 32 items reflects, according to the authors of the test,

> an experimental and flexible orientation rather than a fixed way of viewing and organizing phenomena. High scorers are tolerant of ambiguities and uncertainties; they are fond of novel situations and ideas.

The main effect of Teacher *Co OPI* on student Written Response to Literature Test scores was significant ($F = 7.72$, $p < .03$). The conclusion to be made from an analysis of the data was that teacher tolerance to ambiguity and preference for complexity did contribute to the development of student ability in written response to literature and that it is effective to a similar degree with all students rather than interacting with specific student *Co OPI* groups. One of the recommendations of this study was the need for further research into the characteristics attributed to high *Co* scorers and low *Co* scorers through observation and evaluation in the classroom in order to define teacher behaviors which could be associated with effective and noneffective teachers. If learning outcomes of students relate to high complexity teachers, then it seemed probable that a trait such as tolerance to ambiguity and preference for complexity as measured by the *Co Scale* of the *OPI* would relate to cognitive verbal reactions which the teacher creates in the classroom. A second study by Peters and Amburgey (1982) focused its attention on determining if there were differences between the cognitive verbal reactions in classroom environments created by teachers who score high on the *Co Scale* of the Omnibus Personality Inventory and teachers who score low on the *Co Scale* of the Omnibus Personality Inventory.

In order to analyze this problem, the following question was investigated:

> If teachers are randomly selected from a group who score High on the *Co Scale* of the OPI and teachers are randomly selected from a group who score Low on the same scale, will there be a difference in the cognitive verbal reactions which High and Low teachers create in the classroom?

Teachers with the six highest and the six lowest scores on the *Co Scale* were identified and freshmen college classes of each teacher selected were observed by a trained observer for a period of four weeks. This four week period was divided into two weeks at the beginning of the semester and two weeks at the middle of the semester. The observation instrument used to code cognitive verbal reactions was Gordon

Mork's Verbal Reaction Behavior Log (1971). The VRBL allows an observer to record the type and level of verbal behavior according to the categories and subcategories identified. The VRBL has three major categories, Cognitive, Skill, and Affective, with three subcategories under each heading. Cognitive Level I consists of facts and names; Cognitive Level II encompasses generalizations and major ideas; Cognitive Level III includes problem solutions and creative ideas.

The study included a finding of significance in the main effect of the cognitive verbal responses in classes of the teacher characteristic measured by the *Co Scale* of the *OPI* (Cognitive Level I, $F=6.85$, $p<.03$; Cognitive Level II, $F=5.43$, $p<.04$; Cognitive Level III, $F=4.87$, $p<.05$). This study provided evidence that high complexity teachers move their students into higher levels of cognition which allows for challenges to student thinking. Since students in the high complexity classrooms and students in the low complexity classrooms exhibited almost the same verbal reactions at Cognitive Level I, students were receiving basic information early in the semester. Students in the low complexity classrooms continued receiving basic information even at middle semester; however, students in the high complexity classrooms moved on to other, more complex cognitive levels at middle semester. A description of those persons who score high on the *Co Scale* of the *OPI* reveals tendencies toward those skills which seem best to foster the thoughtful response process and which seem best to sustain the process of inquiry in the classroom. It may be worthwhile to use research findings from studies of this nature to create in English teacher candidates an awareness of their basic potential in these areas by using the *Co Scale* as a diagnostic tool. If it may be worthwhile to bring candidates in English education to an awareness of their basic potential in those areas measured by the *Co Scale*, it may be equally worthwhile to identify teacher behaviors which can be associated with these teacher characteristics and to permit candidates to model these behaviors in simulated classroom situations. Beyond the generic teaching competencies, then, are those additional teaching competencies specific to various disciplines and to specialization areas which also must be provided a research base to validate the conceptual frameworks for teaching specific subject matter.

IMPLICATIONS FOR FUTURE RESEARCH

The rapid growth of the knowledge base supporting effective teaching and effective schools requires preparation programs to respond to this knowledge base. However, the complexity of teaching and learning does not permit simple solutions to complex problems. Teachers respond to a large number of demands, some of which are competing; therefore, teachers must be able to seek out alternatives to maximize desired outcomes.

A major responsibility of teacher preparation programs is to provide a context for rendering professional judgments. As Virginia Koehler (1983) suggests, structures to encourage constant updating of the knowledge base must be developed within teacher education institutions. On-going research projects need to be developed in which faculties are actively involved in preservice programs. Permanent faculty at such institutions would provide continuity and direction to overall research projects while

doctoral students become a part of the projects and work on specific subproblems for their dissertations. Such on-going projects would help provide the money, staff, and equipment needed to carry out significant research and would make possible more longitudinal research studies. Only with this kind of a base for research will studies be grounded in theory and will a number of research designs be utilized. Only in this way can we best involve classroom teachers and the problems they face.

Institutional structures which encourage research into not only optimum generic teaching strategies but also teaching styles for specific levels of the elementary school and for specific areas of the secondary school should produce a substantial array of research by which teacher education institutions can best diagnose and develop teaching potential within teacher education candidates. These kinds of research, coupled with other kinds of knowledge, will help to allow candidates to enter the teaching profession applying information intelligently in whatever teaching context they are placed. Such a knowledge base incorporated into teacher education programs should make such programs capable of producing teachers who can both know and explain what it is they wish to accomplish in the classroom and who can positively effect the learning of their students. Given the possibilities for teacher training which presently exist, it can, indeed, be the best of times for education.

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THE INSTRUCTIONAL CYCLE: ON TEACHING THE TEACHER

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The overriding goal of teacher education is to foster the development of the most effective teachers possible. Teacher educators seek to achieve this goal by instructing their students in pedagogy; that is, furnishing future teachers with the knowledge and skills that research and practice have determined to be essential elements of the teaching profession. In addition, instructors in English, math, science, and other content areas share their specialized knowledge with those who will undertake a career as teacher. On a daily basis, college instructors disseminate information about the content and techniques of teaching to students as part of their teacher preparation. Along with the intended instruction, however, teacher educators may be inadvertently teaching more about teacher-student roles than they realize.

The preservice teacher has a multitude of educational experiences during college that help to shape perspectives on the appropriate behaviors of teachers and students. In most of these experiences (i.e., the typical college class) the student sits at a desk or table in a room with thirty or more other students and listens to an instructor lecturing. Although there may be occasional opportunities to ask for elaboration or clarification, the overwhelming majority of student behaviors can be classified as attending, note-taking, day-dreaming, and napping. Even though we *tell* our students that effective instruction requires the active, meaningful participation of the learner, we seldom put this information into practice.

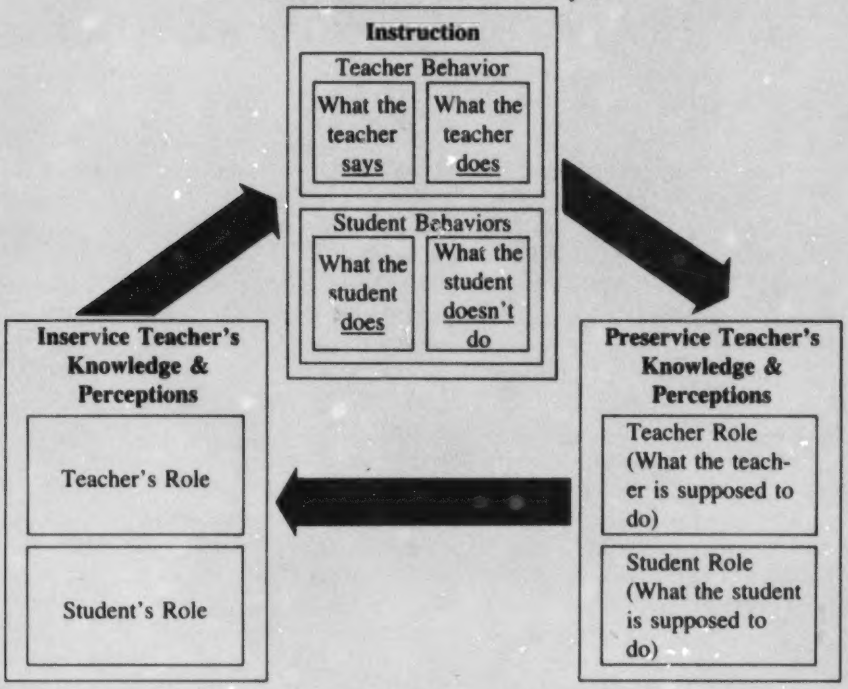
In this paper, first, we will consider a model of the effects of instructional interactions on preservice teachers' emerging perceptions of teacher-student roles; that is, what they think teachers and students are supposed to do, and, ultimately, what they as teachers, expect and do. Second, we will examine the mode of instruction that predominates in the large, college class that preservice teachers so often encounter. Finally, we will present an alternative approach to instruction based on research on generative or elaborative processing which we feel offers great promise for the improvement of preservice teacher education.

INSTRUCTIONAL CYCLE MODEL

The development of teachers is a highly complex process, and we will make no attempt to provide a definitive or exhaustive analysis of this process. We would, however, like to highlight certain aspects of this process that we feel are important in determining how teachers come to teach the way they do. As illustrated in Figure 1, the model of the instructional cycle suggests that the instruction preservice teachers receive determines their perception of student and teacher roles. These perceptions remain

when preservice teachers cross the threshold and ultimately influence the instruction they deliver.

Figure 1.
Model of The Instructional Cycle


Instruction
Teacher Behavior
What the teacher says
What the teacher does
Student Behaviors
What the student does
What the student doesn't do
Inservice Teacher's Knowledge & Perceptions
Teacher's Role
Student's Role
Preservice Teacher's Knowledge & Perceptions
Teacher Role (What the teacher is supposed to do)
Student Role (What the student is supposed to do)

The model characterizes instruction in terms of teacher and student behaviors. If we are to understand the impact of the teacher, we must examine not only what the teacher *says*, but also what the teacher *does*. For example, for a teacher educator presenting a lecture on mastery learning, the content of the lecture, the words used, constitutes the explicit message of instruction. The way in which the lecture is delivered, and the fact that the instruction is delivered as a lecture rather than as a discussion, demonstration, or other instructional activity, makes up the implicit message of instruction.

Student behaviors are characterized in terms of what the student does and does not do. For the student attending the mastery learning lecture, listening and taking notes are likely behaviors. On the other hand, applying the information presented or generating new examples of concepts may be totally absent. The way in which students are tested is also crucial in determining what students will or will not do. If testing requires memorization rather than application, student studying behaviors are likely to be heavily rote.

The instruction that preservice teachers receive influences their perceptions of teacher and student roles. While in this paper we will focus on college instruction, it is assumed that all schooling will have an effect on role learning. It is also assumed that

the learning of the role of teacher does not develop, and cannot be conceptualized, apart from the role of student (see Biddle & Thomas, 1966, for detailed information on role development). The definitive aspect of both student and teacher roles is their interactions, what Bandura (1978) refers to as *reciprocal determinism*.

The knowledge and perceptions acquired then carry over to set the beginning teacher's expectations of teacher and student roles, which influences the instruction that the teacher delivers, completing the cycle. Although not represented in Figure 1, feedback is conceptualized as occurring at two points in the cycle. The preservice teacher's (or, for that matter, any student's) expectations of student and teacher roles will influence subsequent instructional experiences, and the inservice teacher's instructional experiences may modify and refine teacher and student roles.

What then are the implications of this instructional cycle for teacher training? If we are to nurture teachers with realistic and constructive views of teacher and student roles, we must provide instructional experiences in which we, as teacher trainers, model appropriate teacher roles. As the research on observational learning and modeling suggest (Bandura, 1977), what individuals *see* is likely to influence their behavior as much, if not more than, what they *hear*. In essence, the teaching behaviors of college instructors are as important to the development of effective teachers as the information they convey.

Teacher educators must be alert to the fact that they are modeling the teacher role even when they do not purposely intend to do so. The modeling effect is an inherent, on-going aspect of teacher-student interactions (Good & Brophy, 1984). The research of Bryan and Walbek (1970) suggests that if a discrepancy exists between what is said and what is done, students are more apt to attend to what is actually observed. Practice, in other words, is a more effective teacher than is preaching.

Given this situation, then, teacher educators need to examine what college teaching practices tell students about acceptable teaching behaviors, and the appropriateness of this information. What message do our actions send to preservice teachers, and how well does this message match the one we verbally convey? What happens to preservice teachers during their college years seems even more critical when we consider the fact that they have made the decision to become teachers and are, perhaps, more aware of the behaviors of practicing professionals. Further, there is precious little time to instill effective behaviors and essential knowledge in these future teachers. If our actions as teacher educators do not positively extend the information conveyed in classes, we may be working against ourselves, as well as against the clock.

In addition, we must provide preservice teachers with adequate opportunities to learn and practice appropriate student behaviors, especially those that serve to produce effective learning. Having briefly outlined the instructional cycle and considered the requirements of making it suit the needs of preservice teachers and their future students, we will consider how well current instructional practices meet these needs.

THE COLLEGE INSTRUCTIONAL EXPERIENCE

What, then, goes on in our college classes? One apparent trend is that more and more college teaching is being conducted in large group settings, and there is little

reason to believe this trend will soon be reversed (McKeachie, 1980). From a practical standpoint large classes help colleges cope with large enrollments and decreasing funding by reducing per pupil expenditures (Moore, 1977). Large classes are especially predominant in lower level, introductory classes. These classes provide prerequisite knowledge to students and are their first taste of college instruction.

Research has shown that the largest percentage of instructional time in large classes is spent by teachers lecturing, with a minimum amount of time spent by students verbalizing (Lewis, 1982). There is also evidence that student achievement generally decreases as class size increases (McKeachie, 1980). Although recall of factual material may hold its own in lecture classes, application of knowledge, problem-solving, and attitude differentiation appear best served through other instructional experiences (Siegel, Adams, & Macomber, 1960). Large classes also tend to produce multiple choice, matching, and other objective tests, which, though economical to grade, may contribute to a passive, rote-memorized role among students.

What does all this information suggest to teacher educators about the incidental training preservice teachers are receiving? It suggests that while teacher educators speak about individualization, diversity of teaching techniques, grouping strategies, and the application of knowledge, students observe something quite different. Consequently, the explicit messages about effective teaching may be lost to preservice teachers who experience instruction in a passive, receptive mode.

SEEKING ALTERNATIVES

In light of existing conditions in college classes, what can we as teacher educators do to break into the cycle and bring about changes in the learning and instruction of future teachers? One implication of the rapid development of the information-processing perspective and its attendent shift in the view of learning from the passive reception to the active construction of knowledge is that questions about what students *do* become paramount. Although there is little research that directly addresses this issue in relation to large college classes, there has been much research on learning from text that has focused on what the learner does. A review of this literature (Goetz, 1984) suggests that students will learn and remember more when they:

- study the text in a deep, semantic fashion
- form mental images
- construct an organized, interrelated representation
- bring to bear appropriate, prior knowledge and incorporate new information with what they already know
- process the material initially in a manner consistent with testing conditions
- engage in planning, monitoring, and regulating

Therefore, we can model instruction that engenders active student participation and can provide preservice teachers with valuable experiences in the role of active student participant.

Although the research of Wittrock (1974, 1983), Weinstein (1978, 1982), Mayer

(1975, 1979), Dansereau (1978, in press), and others has focused on the role of generative or elaborative processing in learning from text. Table 1 lists many generative activities that could be incorporated in a large class setting if we are willing to stop lecturing long enough to let our students more actively engage in the learning process. Stopping in the middle of a lecture to have students paraphrase a principle or summarize what has just been said, or to have them compose or analyze metaphors or generate new examples or analogies would provide an opportunity for generative processing. Implementing such activities in large classes, however, takes careful planning. There is simply no time to call on each student in turn. Therefore, introducing elaborative student activities requires that students work individually, in pairs, or small groups.

TABLE 1

ELABORATIONS AND GENERATIONS

Teacher or Test Elaborations	Learner Generations
Headings and subheadings	— Compose headings and subheadings
Titles	— Compose title
Familiar stories and words	—
Underlined, circled, or checked words and sentences	— Underline, circle, or check words and sentences
Questions	— Develop questions
Objectives	— Write objectives
Summaries	— Give summary
Main ideas, rules, and principles	— Abstract main ideas, rules, and principles
Relations (between parts of text and experience)	— Relate text to experience
Explanations	— Write or discuss explanations
Inferences	— Draw inferences Predict next event, outcome
Interpretations (analysis and synthesis)	— Analyze or synthesize
Metaphors	— Compose metaphors
Analogy	— Give analogy
Examples	— Provide examples
Pictures and partial pictures	— Image and draw pictures
Graphs and tables	— Prepare graph and tables
Maps	— Draw maps
Blanks	— Fill in blanks
Paraphrases	— Say in own words
Applications	— Solve problems Apply principles Discussion and related group work Discuss story Read story or partial story Act out story Retell story Evaluate story Write story

"From Wittrock, 1983"

ELABORATIVE TECHNIQUES IN A LARGE COLLEGE CLASS: A PRELIMINARY TEST

In order to examine their efficacy, we recently implemented generative activities in an undergraduate educational psychology class of approximately 70 students (Goetz, Alexander, & Burns, 1983). To the extent possible, activities listed in Table 1 were included in each class session. The experience left several strong impressions that we would like to share.

1. Elaborative activities can be developed for most of what we teach.

During the course of the semester, elaborative activities were applied to a range of materials. For example, after discussing classical and operant conditioning, students were asked to compare and contrast the two. Students were also asked to generate new examples of contingency statements after hearing about contingencies of reinforcement (e.g., If you mow the lawn, I'll give you $5).

2. Implementing elaborative activities in large college classes is possible but certainly not trivial.

When employing elaborative activities, a balance must be found between leaving the task so open that students lack adequate guidance, and being so directive as to make active generation unnecessary. From the evaluation data gathered during the study, there was an apparent relationship between the perceived effectiveness of the activity and the clarity of presentation.

3. The effectiveness of elaborative activities in large classes reflects student differences.

The student evaluations demonstrated a wide range in the perceived effectiveness of each elaborative activity. For example, for the activity comparing and contrasting classical and operant conditioning, 12% of the students felt the activity interfered with learning, 42% felt it had no effect on learning, and 46% felt it facilitated their learning. One explanation for this discrepancy is that certain strategies may prove more or less effective for individuals based on their content knowledge and strategy repertoire.

4. Students may not be comfortable when asked to engage in elaborative activities.

Although Lewis (1982) concluded that college students preferred "innovative" teaching methods (e.g., programmed or TV instruction) over lectures, these methods brought changes in the instructional routine without major shifts in student roles. When changes occur in the role of the student, requiring more active involvement in the learning process, students may experience discomfort. It should also be acknowledged that a number of lecturers also are likely to experience discomfort at the thought of relinquishing their pulpits.

5. Students may need training in the use of elaborative activities.

The passive, receptive mode of learning may be so overlearned in college students and teachers that they will require assistance to break out of their instructional routines. To illustrate, we asked our students why Piaget's stages of cognitive development are like the development of an insect. We had hoped that insect development would

provide an analogous situation to which the newer information about cognitive development could be related. We provided a brief synopsis of insect development as an aid to those students lacking adequate knowledge of the topic. After completion, students' written responses were classified as appropriate, inappropriate literal, unrelated, or composite (cf. Vosniadou, Ortony, Reynolds, & Wilson, 1983). Of the interpretations generated by our students, 8% were unrelated, 18% inappropriate literal, 47% composite, and only 27% appropriate. Perhaps some or all of the 73% who failed to generate appropriate interpretations could benefit from training in the use of metaphorical language as a learning technique.

6. Providing adequate feedback to students is crucial.

If students sometimes generate inappropriate elaborations, provision of corrective feedback will be necessary to prevent detrimental effects (Wittrock, 1983). Cooperative student pairs and instructor-provided examples of appropriate elaborations may fill this need.

CONCLUSION

If schools are ever to fulfill their potential and become places of optimal learning rather than the objects of national concern and dismay (e.g., National Commission on Excellence in Education, 1983), we must break into the existing instructional cycle. Future teachers must learn more productive, complementary teacher-student roles. Further, teacher educators must be instrumental in bringing about this change.

As teacher educators, our greatest impact on our students, the teachers of tomorrow, will be in the instructional roles we model and the instructional experiences we provide. Since teacher educators have access to preservice teachers for only about four years following some 12 years of previous schooling, this task may prove as difficult as it is essential. It is critical, however, that we undertake this task, because students will, in any case, learn about teacher-student roles during their college experience. We cannot relegate the responsibility of constructive modeling to supervising teachers during the student teaching period. It is only through our own initiative that we can break into the instructional cycle and alter it, so that existing inadequacies are not perpetuated. To accomplish this, however, we must seek alternatives to the passive-receptive mode of instruction that is predominant in college classes. Elaborative processing research may provide such alternatives, furnishing tomorrow's teachers with more constructive modeling of teacher-student roles, and more effective learning experiences.

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FOOTNOTE

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PROMOTING COMPUTER LITERACY IN HEALTH EDUCATION

B. Sue Beall

One objective of computer literacy for teachers is being able to use a variety of preprogrammed computer software in teaching, and being able to determine the value of computer programs for instructional purposes. Cobern, Kelman, Roberts, Snyder, Watt and Weiner (1982) have proposed that citizens in a computer-based society need to be literate with computers in the same way that people need to be literate with the languages they speak, read and write. Research which determines what value or usefulness computer programs have for instructional purposes in health education appears to be scant (DeSonior, 1982; Ellis & Raines, 1982; Somand, 1981). These studies indicate that Computer Assisted Instruction (CAI) in health education may improve health knowledges and attitudes. The literature reviewed did not address the usefulness of microcomputer programs in the high school health education class. This paper addresses the comparison of student ratings and teacher ratings for two pieces of alcohol education software.

PURPOSE

The primary purpose of this project was to provide student teachers in health education experience in utilizing the microcomputer for teaching a health topic. To do this a research project was designed to evaluate the usefulness of two alcohol education simulation programs, "Beer Bust" and "Time Out," which were used with two high school health education classes during an instructional unit on alcohol education. The secondary purpose was to determine if similarities occurred between student perceptions and teacher perceptions of the alcohol education simulation programs "Beer Bust" and "Time Out" during the formative evaluation of the two simulation programs.

PROCEDURE

To determine the usefulness of the two microcomputer programs the opinions of students and the opinions of teachers were compared. The software was reviewed by 15 teachers, and 68 students. The students were enrolled in health education classes in two high schools in Bryan, Texas. Five of the teachers were computer literacy teachers and 10 were health educators (six were secondary school health educators and four were pre-service student teachers in health education). There were 30 students in grades 10-12 and 38 in grade nine who evaluated the two alcohol education simulation programs.

The evaluation instruments completed by the student groups and the instrument completed by the faculty group were matched in content over 13 items on Likert

Scales. The ninth grade group (N = 38) was given a 13 item Likert Scale, which was the short form of the evaluation instrument used to evaluate the alcohol education simulation programs entitled "Beer Bust" and "Time Out". The rating scale utilized with the teachers and senior high school students (grades 10-12) included 18 Likert Scale items and four ranking items. The longer instrument is shown in Figure 1 with the 13 matched items marked with an asterisk.

Figure 1

"BEER BUST" AND "TIME OUT" EVALUATION

Please rate the following characteristics of the two alcohol simulation programs on the following scale:
(SA) = Strongly Agree (A) = Agree (NO) = No Opinion
(D) = Disagree (SD) = Strongly Disagree

*1.	Content is accurate	SA	A	NO	D	SD
*2.	Program is free of stereotypes (Sex, Race, Age, Ethnic or Religious)	SA	A	NO	D	SD
*3.	Screen is easy to read, well spaced and uncluttered	SA	A	NO	D	SD
*4.	The program is easy to use	SA	A	NO	D	SD
*5.	All visuals are well designed and accurate	SA	A	NO	D	SD
*6.	The program is free of errors	SA	A	NO	D	SD
*7.	Instructions are clearly stated and complete	SA	A	NO	D	SD
*8.	Language level is appropriate for your age group	SA	A	NO	D	SD
*9.	Program defines new words	SA	A	NO	D	SD
*10.	I enjoyed the program "Beer Bust"	SA	A	NO	D	SD
*11.	I enjoyed the program "Time Out"	SA	A	NO	D	SD
*12.	I was totally bored with this lesson using the microcomputer	SA	A	NO	D	SD
*13.	This computer activity was a nice change from the usual class activities	SA	A	NO	D	SD
14.	There is a clear indication of the desired response	SA	A	NO	D	SD
15.	The program is self-paced	SA	A	NO	D	SD
16.	Illustrations are used to emphasize important information	SA	A	NO	D	SD
17.	Program handles inappropriate responses effectively	SA	A	NO	D	SD
18.	Instructions are present with the program	SA	A	NO	D	SD

Please rank the following items from one (1) to five (5) where 1 = low and 5 = high.

19. The MOST appropriate setting (where) for the computer program "Beer Bust" in health education is:

health instruction classroom
teen clinics
library/instructional resource center
youth groups (Girl Scouts, 4-H, Church groups)
counselor's office

20. The MOST appropriate setting (where) for the computer program "Time Out" in health education is:

health instruction classroom
teen clinics
library/instructional resource center
youth groups (Girl Scouts, 4-H, Church groups)
counselor's office

21. The MOST appropriate population (who) for these two computer programs in health education is:

Beer Bust	**Time Out**
7-9th grades	7-9th grades
10-12th grades	10-12th grades
4-6th grades	4-6th grades
teachers	teachers
parents	parents

22. The MOST appropriate implementation (how used) for these two computer programs in health education is:

Beer Bust	**Time Out**
In drug education program	In drug education program
To motivate discussion	To motivate discussion
To clarify values	To clarify values
To emphasize responsibility	To emphasize responsibility
In a free period for individual use	In a free period for individual use

The two microcomputer simulation programs were utilized as a class activity during an alcohol education unit taught by two student teachers during the Spring semester, 1984. Each student teacher had taught alcohol information prior to the utilization of the simulation programs, and both used the lecture with discussion methodology to teach about alcoholic beverage use and abuse. The data were collected from students immediately after they had used the two simulation programs one time. Data were collected from the computer literacy and health education teachers by mail and in person. The teachers were asked to progress through the programs only one time prior to completing the evaluation form.

The two simulation programs were utilized by two student teachers to establish a base of information on how students evaluated health education software and how they felt about using the microcomputer in the classroom to teach health education. The simulation programs were further utilized by the student teachers to assist them in meeting three objectives: 1) to define BAL (blood alcohol level); 2) to list three immediate effects of drinking alcoholic beverages and three long term effects of drinking alcoholic beverages; and 3) to review steps of the decision making process

used when given an alcoholic beverage drinking simulation. Since the computer programs were not used as the sole means of instruction, no attempt was made to determine the effectiveness of this method in attaining these objectives.

The software evaluation data collected from students and teachers were treated with the chi-square technique to determine the relationship between student opinion, and teacher opinion on usefulness of the software. The chi-square technique was utilized to determine the degree of relationship between student and teacher favorableness toward using microcomputer programs as a method of teaching and learning health education.

RESULTS

Response frequencies to each item on the opinion scales were compared for each of the three groups, ninth grade students, 10-12 grade students, and teachers. Significant differences were noted on four of the items. Table 1 presents the item numbers, their chi-square values and their accompanying level of significance.

Table 1

ITEMS SHOWING SIGNIFICANT DIFFERENCES IN OPINIONS OF STUDENTS AND TEACHERS

Item	Chi-Square	DF	P
# 1	15.3	4	0.0047
#12	24.8	4	0.0002
#14	6.2	2	0.0435
#17	11.0	2	0.0046

The .05 level of significance was set apriori, and each of the four items in Table 1 met that criteria. Further chi-square tests to determine which groups demonstrated the greatest degree of difference in opinions were conducted on each of these four items. Each of the two student groups and the teacher group responses to the Likert scale produced a three by five contingency table for each of the items. This comparison produced a number of cells with less than five frequencies. For this reason the *Strongly Agree* and *Agree* cells were collapsed together and the *Disagree* and *Strongly Disagree* cells were collapsed together to produce a three by three contingency table with more frequencies in each cell.

For item #1, "The content is accurate", the responses of the three groups were significantly different. The significant difference existed between the opinions of all students and the teachers. A chi-square of 15.3, df = 4, and a P of 0.0047 for these three groups was noted. Significant differences were also noted between each of the three groups when the chi-square was applied to determine where the greatest differences existed between groups. Teachers and senior high students generally agreed with the statement, while ninth grade students disagreed with the statement.

Item #12, dealing with being bored by the two simulation activities on the microcomputer, produced significant differences between all three groups. Further chi-square tests between the three groups demonstrated that ninth graders generally held no opinion or agreed that the computer activities were boring. The 10-12 grade students tended to have no opinion or disagreed with this statement, and teachers tended to disagree with this statement.

The remaining items did not produce significant differences in responses by the two groups of students or teachers. Generally the students and teachers agreed that: 1) the programs were free of stereotypes; 2) the screen seemed easy to read; 3) the program was easy to use; 4) all visuals seemed well designed; 5) instructions were clearly stated and complete; 6) language was appropriate for the age groups; 7) each simulation program defined new words; 8) they enjoyed using the "Beer Bust" and "Time Out" programs; and 8) the computer activity was a nice change from other health education class activities.

Since items #14 and #17 were not on the short form of the instrument they were completed by the 10-12 grade students and teachers. For item #14, "There is a clear indication of the desired response", there was a significant difference in opinion between students and teachers. A chi-square value of 6.0, df = 2, and P = .0435 was noted for this item. The students tended to agree with or have no opinion about this statement, while the teachers were divided in agreement or disagreement to this statement. On item #17, "The program handles inappropriate responses appropriately", there were significantly different responses for the students and teachers. The chi-square of 11.0, df = 2, and P = .0046 on this item indicated the difference statistically of their opinions. The teachers generally had no opinion or disagreed that the programs handled inappropriate responses effectively, whereas students either agreed or had no opinion about how the programs handled inappropriate responses.

Table 2

MOST APPROPRIATE SETTING FOR USE OF "BEER BUST" AND "TIME OUT" MICROCOMPUTER SIMULATION PROGRAMS

Setting	Student Ranking	Teacher Ranking
"Beer Bust":		
Health Education Classroom	3	1
Teen Clinics	1	2
Library/Instruction resource center	2	3
Youth Groups (scouts, church etc.)	4	4
Counselor's Office at school	5	5
"Time Out":		
Health Education Classroom	4	1
Teen Clinics	3	3
Library/Instruction resource center	1	2
Youth Groups (scouts, church etc.)	2	4
Counselor's Office at school	5	5

Six items for ranking the most appropriate setting for use of the two simulation programs and the most appropriate population with whom the programs should be used were included in the instrument given to 10-12 grade students and teachers. The results of these data are presented in Tables 2 and 3.

Table 3

MOST APPROPRIATE AGE GROUP FOR USE OF MICROCOMPUTER PROGRAMS "BEER BUST" AND "TIME OUT"

Age Group	Student Ranking	Teacher Ranking
Beer Bust:		
Grades 7-9	3	2
Grades 10-12	1	1
Grades 4-6	5	4
Teachers	4	5
Parents	2	3
Time Out:		
Grades 7-9	2	2
Grades 10-12	1	1
Grades 4-6	4	5
Teachers	5	4
Parents	3	3

Table 4 illustrates the average rankings for the students (grades 10-12) and the teachers on the most appropriate way to use the two alcohol simulation programs.

The mean rankings were computed for both groups on the most appropriate setting in which the programs should be used, the most appropriate age groups to use the programs, and the most appropriate use of the two programs. The Spearman-Brown Rank Correlation technique was applied to average rankings given by students and teachers on the appropriateness of each of the two simulation programs. Mean rankings for students and teachers on the most appropriate setting for both programs were not closely related. A .70 correlation coefficient was obtained for the "Beer Bust" simulation and a .30 correlation coefficient was obtained for the "Time Out" simulation. Mean ranks comparison on the most appropriate age group with whom the simulation programs should be used provided a correlation coefficient of .90 for "Beer Bust" and a .80 for "Time Out". The correlation of mean ranks on the most appropriate use of the simulation programs produced a correlation coefficient of .90 for "Beer Bust" and .58 for "Time Out."

DISCUSSION AND CONCLUSION

Student teachers using and evaluating software in their health education teaching experience provided validation data regarding use of microcomputer programs in the

Table 4

MOST APPROPRIATE WAY TO USE THE SIMULATION PROGRAMS: "BEER BUST" AND "TIME OUT"

Use of Program	Student Ranking	Teacher Ranking
Beer Bust:		
Only in drug education program	3	3
To motivate discussion in health education class	5	4
As values clarification activity	2	2
Activity to emphasize Self-responsibility	1	1
Free period activity for individual use	4	5
Time Out:		
Only in drug education program	5	3
To motivate discussion in health education class	4	4
As values clarification activity	3	2
Activity to emphasize Self-responsibility	1	1
Free period activity for individual use	2	5

health education classroom. Seven items administered to both teachers and students which dealt with the way the programs progressed or ran free of errors were: #4 (program is easy to use), #6 (program is free of errors), #7 (instructions are clear and complete), #14 (clear indication of desired response), #15 (program is self paced), #17 (program handles inappropriate responses effectively), and #18 (instructions are present with the program). Of this group only items #14 and #17 produced a significantly different response from either group of high school students or teachers when the five levels of responses were collapsed into three levels *agree, no opinion, and disagree*.

The evaluation instrument included items which checked opinions about how the graphics and framing appeared, as well as whether or not stereotypes were present. There were two items which dealt with graphics and frame appearances, #3 and #5. Opinions of students and teachers were similar on these items. Only one item (#2) addressed the issue of whether the programs were free from stereotypes, and this item produced no statistically different variation of opinion between students and teachers.

Four items dealt with how effective the programs were as a method of teaching or learning, or how much the simulation programs were enjoyed as a health education class activity. These were items #10 (I enjoyed the "Beer Bust" Program), #11 (I enjoyed the "Time Out" Program), #12 (I was totally bored with this activity), and #13 (the computer activity was a nice change of pace). Item #11, dealing with enjoyment of the "Time Out" program, was somewhat similar for all groups. Teachers and students were similarly divided on their agreement, disagreement or no opinion to the question. Generally, they agreed or had no opinion about that item. The teachers, however, had a wider variation in opinion with some agreeing, some with no opinion and some disagreeing with the item. Item #12, "I was totally bored with this

lesson", produced significant differences between all three groups. The contingency table of observed frequencies showed a definite trend for ninth grade students to agree or have no opinion, students in grades 10-12 either had no opinion or disagreed and teachers totally disagreed with the item. Teachers may have enjoyed the simulation programs as an activity more than the students. At least they seemed to not be bored as much as students were, or they responded more carefully to all items in the instrument. This item was the only negatively stated item in the instrument, and the response mode may have prompted students to continue marking in the some way. Another explanation of that difference might be related to classroom management. The classroom setting was somewhat different for 10-12 grade students than for the ninth grade students. There were two students for each computer in the ninth grade and four students for each computer in grades 10-12. Accompanying desk work time was longer for the senior high group than for the ninth grade group. In both classroom settings each student was allowed to progress through each program one time. This did not insure that computer time was the same for each student. The nature of the simulation programs depends on user decisions. If non-drinking decisions were made throughout the program, the student progressed faster. With each decision to drink more beer or alcoholic beverage, the user was presented more information. This might indicate that the ninth grade students spent less time looking at the programs. One additional evaluation to consider in the future with simulation programs is the pathway of the user through the program. If the full program is not seen, perhaps the user's evaluation is not valid. A number of repetitions through the program might insure this validity.

The ninth grade group and teacher group opinions were different from 10-12 grade student opinions on item #1. The only explanation the investigator can give for these differences is that perhaps the senior high group felt they were more knowledgable about alcoholic beverages than the information presented in the simulation programs.

No attempt was made in this study to determine the reading level of the programs. Further investigation of reading level would be appropriate at this time to determine if it is above or below the average high school student reading ability. Item #9, "Programs define new words", produced no significant differences between groups. The responses to this item indicated that new words were defined clearly for the user.

Student teachers using and evaluating health education software in the student teaching experience provided an opportunity to determine what differences exist between student and teacher opinions about health education software. This formative evaluation of two simulation programs in alcohol education indicated that students and teachers basically held similar opinions about the software. Students and teachers agreed on five of the seven items relating to the way the programs ran. The 10-12 grade students and teachers disagreed on how the programs handled responses, accuracy of program content, and whether or not the lesson was boring. It would appear from this formative evaluation done by two student teachers during a unit of study in health education that student and teacher opinions are not significantly different when judging health education software.

As health education software is developed and utilized in the classroom, ongoing evaluation will need to be conducted to determine how it affects the learner as well as how effective it is as a method of teaching. Introducing student teachers to using

microcomputers as a method of teaching provides them with a broader experience in computer literacy. Student teachers and teachers learn that opinions of students and teachers are important to determine the usefulness of health education software. As computer literacy is sought in the classrooms of our schools, teachers in every discipline will share in that pursuit. As teachers in health education attempt to find appropriate software and appropriate uses for that software, formative evaluation of this type will be necessary.

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INSTRUCTIONAL LEADERSHIP AND SUPERVISION IN SPECIAL LANGUAGE PROGRAMS

Viola Florez-Tighe

Research in the area of instructional leadership within the context of English as a Second Language (ESL) is greatly needed. While a recent review of ESL research revealed an increase in the number of studies dealing with instructional approaches, language learning theories, ESL curriculum, and learning-aid study strategies, supervision of teaching in ESL programs was mentioned only occasionally in studies related to teacher training.

One significant study which supports the argument for effective supervision was conducted by Valverde (1979a). In a three month survey of bilingual programs in three states—California, Arizona, and Texas—Valverde attempted to determine the extent of instructional leadership in bilingual education. He discovered that supervision of instruction is, in fact, one of the most neglected aspects in the process of implementing dual-language programs in the public schools. The study concluded that current supervisory practices of bilingual education programs were random, unsystematic, and in most cases virtually nonexistent. Valverde proposed that major deficiencies in the supervision of these programs could be eliminated by clearly defining staff roles and providing the training needed to establish an effective program.

The importance of high quality instructional supervision in all educational programs is unquestionable. Those interested in special language programs of limited-English proficient (LEP) students should therefore direct sufficient time and effort to the leadership sector through instructional supervision. Supervision, when properly practiced, can provide a mechanism to: (1) promote the growth of instructional staff members, (2) improve the instructional program for LEP students, and (3) foster effective curriculum development.

Current literature presents a view that supervisors and teachers hold divergent views regarding supervisory effectiveness. A decade ago, Blumberg (1974) stated that teachers felt that supervisors were out of touch with classroom needs, were not sincere, and lacked interpersonal communication skills. A more recent survey by Blumberg (1980) upheld these teachers' views, indicating that general supervisory personnel apparently lack the bilingual training to fulfill most of their assigned duties and responsibilities. Other research has reported that general supervisors are not technically competent in the performance of those tasks most directly related to ESL or bilingual instruction, nor to the improvement of those specific tasks. Further, these teachers and supervisors tend to avoid one another (Alfonso & Goldsberry, 1982).

Many individuals assigned as curriculum supervisors are placed in supervisory roles for special populations programs, yet are not adequately trained to implement or supervise programs designed for LEP students. Hence, the instructional leadership sector is missing from the overall program, and the ESL teacher is left with a severely limited instructional support network. Under these conditions teachers are left to their

own devices to develop an effective program.

Valverde (1979b) reported in another study that only 5% of the supervisory staff of Texas Independent School Districts are certified by the Texas Education Agency as having successfully completed an academic program in supervision. Further, many of the Texas school districts circumvent the requirement of supervisory credentials by appointing instructional support staff as "resource teachers".

English as a Second Language educators are in need of leadership, with many of the problems confronting them compounded due to the lack of leadership and supervisory support. Although competencies have been identified for ESL teachers, the implementation and effectiveness of an ESL program goes beyond classroom competencies, encompassing the realization that competent supervisors and instructional leaders in programs designed for LEP students are of primary importance.

It has been almost five years since the publication of Valverde's study, and the instructional supervision of dual language programs is still unstable and relatively undefined. Supervisory conditions of special language programs are currently better than they were five years ago, but additional research is needed to provide clarity of the roles, responsibilities, and interpersonal skills needed for developing an effective instructional leadership component in special language programs. The goal of this paper is to reinforce an awareness of the need for improving supervisory leadership in programs designed for LEP students.

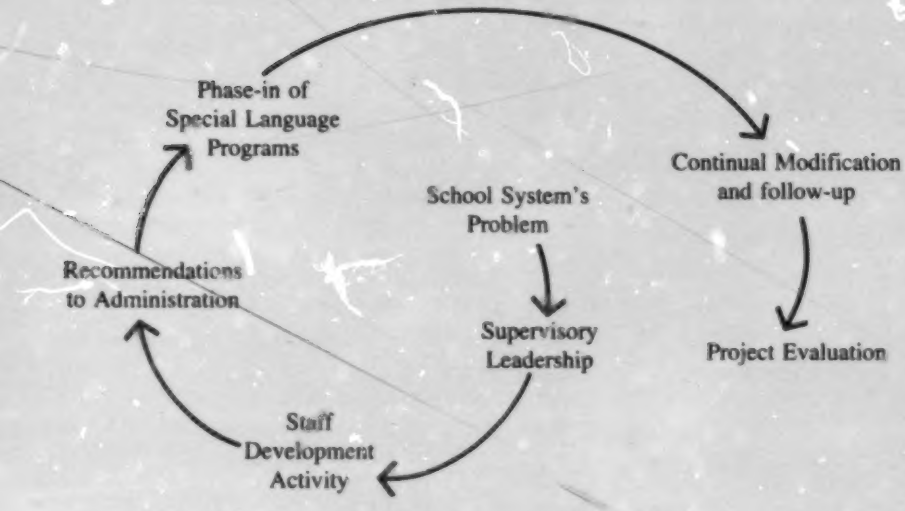
INSTRUCTIONAL IMPROVEMENT

Determining the focus for assistance needs to be a primary activity of supervisory leadership. This focus becomes a function of the educational philosophy and goals of the instructional program. The main concerns involved in special language programs are (1) who will be involved? (2) what assistance is needed? and (3) what rate of implementation is realistic? Very often supervisory leadership is accused of data gathering without subsequent analysis and interpretation, a situation akin to that of the guidance counselor who has the means to provide depth and breadth to planning student programs, but who may not put his information to optimal use. Kopp and McNeff (1969) originally developed a model for elementary school programs in which the principal is flexible in determining the focus of assistance for the special languge program (see figure 1). This model, properly implemented, can provide input, leadership, and follow-up essential for effective special language programs. Involving special language program teachers in curriculum development and design of evaluation tools often used by supervisory staff could lead to more effective program implementation, and to more objective program evaluation.

A special language program designed for teaching LEP students needs clarity and specificity of competencies, roles, and responsibilities for direct in-class supervision of the bilingual or ESL teacher. Special language programs that address the meaningful implementation model can provide the instructional leadership needed to support program effectiveness.

Figure 1

SUPERVISORY MODEL FOR SPECIAL LANGUAGE PROGRAMS



The major concepts which have influenced the development of this model came from Kopp and McNeff (1969), *Guidance Handbook for Personnel of Elementary Schools*.

SUPERVISING COMPETENCIES

The supervisor of a special language program needs the knowledge and practical experiences of teaching linguistically diverse students in order to provide instructional improvement in bilingual or ESL classrooms. Often we find that supervisors of special language programs lack the training and the teaching experience necessary to supervise and evaluate teachers of LEP students.

The supervisory personnel assigned to provide leadership to special language programs are basically responsible for the design and implementation of the program, that is the evaluation of student needs, implementation of instructional methods and strategies, and assessment of language dominance and proficiency.

In the field of bilingual or ESL education, the primary goal of the supervisor is to provide in-class support to classroom teachers. The supervisor's role is basically that of resource leader. The supervisor should provide support along with needed information and practical experiences for professional improvement of the teachers supervised. In

addition to supervisory functions, the supervisor is often times requested to carry out general administrative functions. Lucio and McNeil (1979) have stated that conditions in schools do not always permit the operation of logic-tight compartments of line and staff authority and influence. In the implementation of special language programs, supervisors are sometimes not delegated authority, yet are held responsible for results. They must therefore be very persuasive in encouraging others to carry out instructions.

Bilingual and ESL supervisors must establish a special cooperative relationship with classroom teachers. They must establish a "helping relationship" in order for the supervision to be effective and bring about instructional change. There are several major competencies supervisors of special language programs need to fulfill:

1. Demonstrate a sensitivity for diverse linguistic and cultural classroom settings;
2. Demonstrate general knowledge of program development, planning, and evaluation;
3. Demonstrate knowledge of the subject matter necessary for implementation of bilingual or ESL instructional methods;
4. Demonstrate skill in designing and implementing instructional strategies to develop the student's specific listening, speaking, reading, and writing skills in English, or in a dual language if supervising a bilingual classroom;
5. Demonstrate skill in dual language development and assessment;
6. Provide leadership in the ESL or bilingual program evaluation process;
7. Develop a well-organized inservice education program relative to the needs of ESL/bilingual teachers;
8. Assist the school staff in the diagnosing of the needs of LEP students, interpreting assessment instruments, and utilizing results for identification and placement;
9. Encourage school administrators and participating staff in identifying and solving instructional problems related to coordination of regular and special language programs;
10. Assist in the evaluation and selection of instructional programs, materials and equipment with regard to supporting the ESL or bilingual program;
11. Focus interaction with bilingual or ESL teachers on specific instructional strategies, demonstration teaching, content questions, etc.; and
12. Encourage and promote positive community relations through effective dissemination of information.

The general competencies suggested in this paper are dependent on program design, implementation, and commitment from each school district. In the State of Texas, the Texas Education Agency (1978) has designated 39 teacher competencies within the following five areas: 1) language, linguistics, and content; 2) culture; 3) testing methods; 4) instructional methods; and 5)instructional material use. Teachers and supervisors in the Texas Special Populations Language programs must use this list

of competencies as criteria for improving teacher performance since they are considered crucial to effective instruction within a classroom setting of limited-English students. The monitoring of special language program implementation by the Texas Educational Agency (1978) is conducted using a "monitoring checklist" which includes items from the list of competencies. This checklist can be adapted and utilized by the local school district to help the special language teacher and supervisor evaluate teacher performance and program effectiveness.

In summary, current literature clearly defines the need for instructional leadership in programs identified for limited-English proficient students, and efforts to develop a delivery mechanism for leadership can yield multiple benefits to special language programs. It is likewise clear that through the use of applied research conducted with field-tested programs and a more holistic approach to supervision, a clearer definition of the role of supervision can be realized. Instructional leadership has been lacking in special programs designed for LEP students, and it is time to evaluate and prioritize the instructional problems confronting minority students placed in programs addressing special populations.

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A PERFORMANCE BASED APPROACH TO CONTINUING PROFESSIONAL DEVELOPMENT

Robert A. Fellenz

A leading Texas businessman recently mentioned that one of his companies was now spending 22.5 percent of its income on the continuing education of its professionals. This may seem excessive at first but not if one pauses to consider the true value of the human resource to success in many of today's enterprises. Then resources poured into continuing development of the professional take on the appearance of an investment rather than a gamble or waste.

The purpose of this article is to suggest that a performance-based approach to staff development can, at least in some situations, take even more of the gamble out of continuing professional development. Suggestions will also be offered for the implementation of comprehensive systems for such continuing education based on the author's decade of experience with a performance-based system for the continuing education of teachers of adults in Texas.

Before entering into a discussion of the advantages and disadvantages of performance-based education, the concept needs to be defined and distinguished from competency-based approaches. In speaking of teacher education, Elam described the process in this manner.

> In performance-based programs performance goals are specified, and agreed to, in rigorous detail in advance of instruction. The student must either be able to demonstrate his ability to promote desirable learning or exhibit behaviors known to promote it. He is held accountable, not for passing grades, but for attaining a given level of competency in performing the essential tasks of teaching.... Emphasis is on demonstrated product or output. (1971, p.1-2).

Notice that the emphasis here is on the performance or actual professional practice of the learner. Many would insist that the same is true in competency approaches; however, a somewhat subtle but important difference exists between the two approaches. Competencies are usually considered composites of knowledge, skills,and perhaps even attitudes that make it possible for an individual to effectively carry out certain behaviors. Competency-based education centers on the skills essential to performance rather than on the professional performance itself. While valid reasons can be suggested for preferring competency approaches, in continuing education situations performance-based systems have certain advantages. Houle (1981) suggests that to perfect our evaluation of continuing professional education we must move beyond measurement of knowledge and skill imparted, or even competency instilled, to the effect of such training on professional performance. If training has not affected better practice, then ultimately it has not been worth the resources poured into it. If results are to be judged by performance, then the system should be based on performance.

ADVANTAGES OF PERFORMANCE-BASED APPROACHES

One of the greatest frustrations of the curriculum developer in continuing education settings is the diverse entry levels of potential participants. It is difficult enough to plan professional training programs for the uninitiated, but when you take a group of mature individuals, educate them in diverse settings, and allow them various levels and durations of practice, tremendous diversity of competency results. Such diversity of participant ability is almost always a mark of continuing education audiences. To this must be added a principle so universally accepted that it has become, at least in theory, a standard axiom of adult educators: learning experiences must be directed to the felt needs of adults if they are to be effective (Knowles, 1970, p.79).

One way of dealing with diversity of entry level and at the same time relating instruction to individual needs is through a system that bases curriculum on professional performance yet allows learners to move in and out of the instructional program at will. Ideally, this is what a performance-based system attempts to do. Curriculum is based on the performances demanded for success in practice; learning is directed by the needs of the participant.

Another ingredient of the continuing education market is the various time constraints involved. Use of the traditional seminar or conference to draw large numbers of busy professionals together in one location breeds frustration. In fact, such frustration has been basic to the efforts of a number of professional groups and certifying agencies who have turned to "mandated continuing professional education." This term is almost self-contradictory, for such efforts have as their standard attendance and instruction rather than learning; professional improvement thus becomes a hoped for but by no means guaranteed by-product.

Considerable flexibility regarding time constraints can be built into educational systems based on performance. For example, a participant needs to spend only as much time on a learning activity as is needed to enhance performance. This is natural to adults; it is what they do in at least 70 percent of their learning activities (Tough, 1978). Yet many of our formal educational programs insist on measuring learning by time-spent-on-the-task. Moreover, performance-based systems frequently can be of sufficient flexibility to coincide with time available to the practicing professional. Study thus becomes available in small or large segments, when the need to learn is most pressing or time is most available.

A planned approach to staff development raises a number of other issues that revolve around the concern of individuality. Some needs arise because of specialization. Only a small percentage of the staff may need training to perform a certain task but that performance may be absolutely essential to the overall operation of the group. Others grow out of geographical or physical constraints. The staff to be trained may be scattered across a state as large as Texas. The instruments upon which learners are to practice their skills may be restrictive in that only a single individual or a small number can engage in such practice at any one time. These reasons vitiate against traditional group instruction.

Performance-based systems lend themselves to individualization. Unless the task

expressly calls for interaction with others or can be learned only through such interaction, a performance-based approach places no unnecessary restrictions on individualization. Many such systems are readily transportable; if not, they can be made available at a time most opportune for the individual with the need to learn. The specialist for whom the skill is essential can use the resources whenever and as frequently as advisable. The instructional equipment or resources can be scheduled almost any hour of the day or day of the week. This tends to make the system adjustable to the needs of the learner rather than the other way around as is traditional in many other approaches to staff development.

Another advantage of performance oriented systems is their motivational appeal. Adults typically are problem centered and practice oriented (Knowles, 1970, p.48). They are much more likely to devote themselves to the analysis of a problem or issue than to mastery of a content area. They are also more likely to deal with content at a higher cognitive level, such as analysis, synthesis, or evaluation, if the content has practical application or if they are likely to use it soon. Thus the field oriented aspects of performance-based systems by their very nature tend to attract highly motivated adult learners.

CONCERNS WITH PERFORMANCE-BASED SYSTEMS

A major concern with performance-based approaches has been their mechanistic nature. Since they are based on performance, they tend to place behavioral concerns above the personal needs of the learner. Principles and practices of behavioral psychology tend to dominate both the theory and practice of such systems. The needs and interests of the individual learner readily give way to prerequisites of the system. While a philosophical discussion of the merits of various approaches to curriculum development undoubtedly would be of some value, philosophy is not the basic issue here. It is rather a matter of psychology. If the adult learner senses an attitude of being used, an indication that the system is directed not to his or her learning needs but to the imposition of predetermined skills, the normal result is disillusionment with the learning activities and abandonment of the operational system. To most adults, this is reminiscent of the child-like treatment given them in the compulsory schooling of their youth. Adults are much more likely to learn efficiently if they have input into the planning and conducting of the instructional activities.

A number of things can be done to make a performance-based system more personal and less mechanistic. Learners should certainly be involved in the planning and continuous evaluation of the performance objectives. Care should be taken to include objectives that contribute to interpersonal relations, to essential values, and to the spirit or climate of the organization or activity. A sufficient number and variety of learning activities should be provided so that the learner can choose a preferred style or level of learning. Such procedures allow system designers to apply behavioral approaches in establishing objectives without surrendering their learner-centered philosophy of education. To ensure this, however, care must be taken to check frequently that one continuously is taking an overall approach in which the learner is

kept central to the planning of the system. This should also guarantee that the training system will not be expected to produce results beyond its potential. The ultimate failure of many performance systems has been due to the expectation that the training system would produce what its creators could not define, i.e., the "master craftsman." Systems based on performance defined objectives are suitable only at levels of operation at which such performance can be defined. Usually this is the basic entry level in a profession or occupation, or stated another way, the minimal skill level essential to use of some new or specialized technique. Performance-based systems are extremely difficult to design for the master performer since the integration and application of relevant skills are difficult to specify.

The other major criticism of performance-based approaches has centered on the difficulty of initiating and maintaining any but the simplest of such systems. It is true that a comprehensive system would require great skill and effort and perhaps more resources than anticipated. Performance-based approaches also require constant supervision by a manager skilled both as an educator and as an administrator. But is the alternative that has frequently been passed off as "continuing professional education" more attractive? Poorly conceived and haphazardly designed, such approaches have relied more on attractive environments, compulsory attendance, or gilded certificates to attract audiences. Only when program developers have put a great deal of skill and resources into the planning and conducting of their activities have they been able to turn out improved practitioners rather than certified participants.

One way of avoiding a mechanistic approach and also limiting the amount of resources dedicated to an instructional program might be to restrict the program to certain aspects of professional practice. An emerging technology, a unique solution to a problem, a new technique for practice—all could easily be dealt with in a performance-based approach.

BUILDING A COMPREHENSIVE SYSTEM

To be effective, a performance-based system must be comprehensive. It must include such elements as: performance identification, assessment techniques, training methods as well as training resources, and opportunities for continued improvement both of the system and of those involved.

Performance Objectives

The method selected for setting the performance objectives upon which the training program will be based is, of course, very important. Also important is some prior thought on how comprehensive the system is to be and what climate or philosophy is to be projected to those involved. At first it might seem that desired behavior should be defined as specifically as possible in order to arrive at a clear and well defined set of objectives. The problem is that specificity does not always lead to clarity of practice. There are well known cases of groups that have conducted elaborate studies of a practice and have concluded that there were something like 1661 professional skills essential to competent performance. Of what practical use are 1600 objectives? They might look impressive in a printed report but are a nightmare to deal

with in practice. While reduction of this number to 16 objectives might be too few to adequately define desired practice, it is much better to begin the development of a system with a set of achievable objectives. Achievable here refers both to the ability of the system designers to build learning activities to teach these skills as well as the learners' ability to attain them. Additionally, the focus needs to remain on the integration of discrete competencies into a competent performance. This focus provides a basis for grouping skills.

Keeping the learners central to the development of the system will, as mentioned above, tend to safeguard against the development of a mechanistic system that will turn off most mature professionals. Thus, the message delivered by the statement of objectives must be considered. Face validity is essential. The professional who compares his or her practice to a realistic set of standards is in reality performing an assessment of personal learning needs. Many would say that this very act is the most essential step in the learning process, especially for the self-directed adult. Thus, the number, the clarity, the apparent validity of the objectives and the manner in which they are presented to the learner sets the climate for the total program.

There are a number of ways of arriving at a list of performance objectives. In general, they can be classified into three groups: (1) surveys of practitioners, (2) recommendations of experts, and (3) observation of practice. Frequently a combination of these will be used to develop a system.

Surveys of those in the field of practice have the advantage of involving potential participants in the development of the system. This is a strong motivational factor and should not be ignored. Countless surveys have been conducted asking practitioners to identify tasks that must be performed by one competent in their field. The basic fallacy of such approaches lies in the fact that few practitioners can adequately define their own practice much less discuss competent performances for the field. The resulting list of competencies tend to be idealized versions of selected aspects of practice. To test this out, take some time yourself to list the behaviors that you see as essential to good professional practice in your own field. See how long it takes for you to come up with even a dozen such practices. Of course, survey instruments can be built which adequately list potential behaviors and can then be used to obtain practitioner input. This, however, gets us into the second approach for establishing objectives.

Gathering input from selected experts in the field is another general approach to selection of performance objectives. The experts can be chosen from various groups, such as experienced practitioners, those considered leaders in the field, or those who have written on the topic. If care is taken to obtain a variety of viewpoints and to stimulate broad thinking on the topic, this approach can produce a fairly comprehensive listing of valued behaviors. Delphi methodologies (Borg and Gall, 1983) have been used to enhance such approaches by going through several rounds of gathering information from a knowledgeable group and then feeding back these ideas for a more informed response from these individuals. When such approaches are used, the tendency to suppress minority opinions must be guarded against. But the major limitation of using the "expert approach" is the liklihood that it will not provide sufficient specificity.

The third general category of methods for selecting objectives involves some manner of observation of performance. Job or task analysis is an example of this

approach. At one time it was quite popular to send in a group of trained observers to note all the tasks performed in a certain occupation. Critics maintained such observations had little reliability and were quite superficial. But task analysis has made a successful reentry into the job defining world, especially in the military services. Well defined procedures for compiling and analyzing an inventory of tasks performed in a field have been developed from reports of workers. This approach generally provides the quantifiable data many decision makers desire. What percent of the population performs a certain task, how much time is spent on it by various groups, how the behavior of neophytes differs from those with experience are all questions easily addressed. Questions of quality are difficult to answer, though. How much time should be spent on a particular task or what important tasks are being left undone are issues usually not addressed through observational approaches.

Frequently designers of systems will choose to employ several techniques for gathering data necessary to defining performance objectives. It is important to bear in mind that the task is not completed until someone has studied these data and made a decision as to which objectives are most fitting for the training program involved.

Assessment Techniques

A performance-based system presumes that someone who is already competent in a certain task will not be given training in the performance of that task. To assist with judgments on adequate performance, managers constantly and adult leaders occasionally want some manner of measuring appropriate performance.

The simplest, and perhaps most professional, way of doing this is to ask the individual to decide on the adequacy of one's own performance. But even when using such a self-evaluation approach, it is helpful to provide some rating indicator. Often, a straight forward listing of the performance objectives with a simple three point rating scale and a clear set of directions will suffice. Those wishing to encourage further self-direction in continuing professional education have used more elaborate forms which incorporate elements of a learning contract with the assessment form. With such contracts the adult learner is asked not only to decide which personal performances need improvement but also to make some preliminary commitment to strategies for strengthening that behavior (Knowles, 1970). The use of such complex formats obligates system designers to provide the assistance needed by individuals to make such self-directing decisions in an informed manner.

Standardized tests are frequently sought as devices for measuring professional ability. These tests have the advantage of being more easily administered and are "the same for everybody." The problem is that standardized tests measure many concepts but seldom measure skilled performances. A completed answer sheet is but a sample of behavior; if that one behavior is representative of the appropriate behavior, it is a good test. A performance-based system, on the other hand, assumes that a series of distinct behaviors must be performed in concert for a competent performance. Besides, the use of tests with adults raises a number of other problems certainly the least of which is not the error of the maxim that "tests are the same for everybody." Standardized tests seldom work well in assessing professional performance (Houle, 1981, pp.258-263).

Perhaps, the most frequently used method of individual assessment in perform-

ance-based programs is some form of observation. Since the subjective judgments of the individuals involved play such an important role in observations, thought must be given to whether it would be more appropriate for such a review to be done by a supervisor, a team of peers, or an outside assessor. Beyond this, standard criteria for good measurement techniques hold for observational approaches as they do for any other approach.

Methods Of Organizing The Training

Before specific resources are gathered or training materials developed, consideration must be given to the general delivery system to be used in organizing the training. Important questions here are: Is a completely individualized approach to be employed or will the training be done through small groups? Will the total potential clientele serve as a constant audience? Who is to supervise the training program? What kind of reward system is to be available to the supervisor? What resources are available for the implementation of the system? Who is to train those who will manage it? What approach will be used for the ongoing evaluation of the program? Answers to such questions provide guidance needed in the selection of training strategies.

The following thoughts may be helpful in developing responses to these questions. Individual methodologies allow for much greater flexibility and tend to put more responsibility for professional development on the shoulders of the individual professional. However, these methods usually demand multiple copies of training materials and entail more detailed management concerns for the developer. The small group situation has been found to be the best arena for promotion of change in behavior, provided the atmosphere is conducive to change and provision is made for practice of the new behavior. The key person in this methodology is the group facilitator or team leader. Strategies aimed at the total group often employ mass media techniques. They call for special expertise not only in design but also in evaluation of their impact on individuals.

Because the ongoing system will be dependent on its management or supervisory staff, it is considered good practice to instill ownership of the system to group facilitators from the beginning by involving them in the design and implementation of the program. Such involvement can also help resolve some of the dissemination and training issues essential to final installation of the continuing education program.

Learning Activities and Resources

The heart of any educational program is, of course, the learning promoted by the system. The other aspects of the program, viz., setting objectives, assessing performance, determining methodologies, are important to the degree that they support the actual learning events. In some situations, there are numerous resources and techniques already available that are well suited to promote the desired training. At other times only creative design of new materials will produce the desired effect. Rather than enter into an elaborate treatise of material development at this point, four principles will be offered as guides for the overall selection or design of learning activities for professionals.

The first two principles have continuously emerged as having significant impact on adult learning: (1) the learning experience must be meaningful to the adult if the content is to be learned efficiently; and (2) the greater the participation of the learner in the instructional activity, the more effective the learning is likely to be (Fellenz, 1974, p.96; McKeachie, 1974, p. 187). Designers of performance-based systems often assume that a behavior judged vital to good performance within that field will be meaningful to all practitioners in the field. The professional may need to be oriented to its importance. But meaningfulness extends beyond content to teaching techniques. Because most adults are accustomed to traditional techniques, invitations to learn through less formal approaches such as role playing or field observation may seem strange and of little value. Here again, orientation to the purpose of a learning technique may be vital to its success.

A third concern in the selection of learning activities and resources flows from the pronounced differences among adult learners. Instruction that is exciting and inspiring to one adult may be boring or confusing to another. Not only do people have different experiential backgrounds and value sets, but recent research (Messink, 1976) indicates that individuals have different learning styles. Some learn well visually; others learn best through auditory modes; still others need to move things around before they understand. Thus, a good system will have a variety of learning activities available for different learners and not assume that the same instructional approach will work equally well for every individual.

One's personal philosophy of education may dictate how important the final suggestion appears but the principle is important for all to consider. Adults see themselves as being in control of their activities; they are used to making decisions. Thus, many writers (Kidd, 1973; Knowles, 1970; Tough, 1978) suggest that adult education programs encourage self-direction by providing opportunities for self-direction on the learner's part. This observation provides a strong rationale for a performance-based system because such an approach purports to be more concerned with ability to perform than with how that ability was developed. Providing a variety of methods and learning resources combined with learner choice of these options will make a system much more appealing to many professionals.

Validating The Process

Feedback and validation loops are important throughout a performance-based system. But they are especially valuable in expediting the learning processes of mature individuals and in justifying systems. This paper will conclude with a few suggestions on implementing feedback loops.

A growing sense of competence is an important motivator for adult learners. The need to know that meaningful progress is being made is so real to adult learners that otherwise successful programs have folded simply because the students were not sure they were making progress. Thus, post-assessment feedback is essential to systems based on performance.

It is evident that those interested in performance-based approaches must also be concerned with methods to appraise professional practice (Houle, 1981). Today we are only beginning to develop and test assessment approaches based on something more

than subjective judgments. Continued attention to the evaluation of practice is needed not only for this approach but for all approaches to continuing education.

No system of continuing education should be considered adequate unless it instills in its clientele attitudes conducive to lifelong learning. The final evaluation of any system might well be based on responses to the following questions. Does the system promote skills and attitudes that will enable the learner to assess one's own learning needs and locate appropriate learning resources? In other words, does it help one learn how to learn? But also, does it help one learn how to plan, how to decide, how to solve problems? These are the marks of a professional; they are also characteristic of lifelong learners. They can be built into a plan for continuing professional development.

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Section III Policy

RETHINKING PIAGET: IMPLICATIONS FOR TEACHER EDUCATION

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Jean Piaget, a Swiss psychologist, observed children for over 60 years. The information he collected formed a theory of cognitive development which has become the standard in the United States, Europe, and most other Western countries (Hunt, 1982). The theory looks at cognitive growth as a series of qualitative changes that occur in a child's thinking (Ammon, 1977) and describes these differences in terms of stages. Children pass from stage to stage through processes which Piaget calls assimilation, adding new information, and accommodation, changing present cognitive structures so that new information fits (Lavatelli, 1973).

This theory of cognitive development places the primary and preschool child in the preoperational stage. Preoperational children, according to Piaget, are beginning to organize objects and information by classifying, seriating or ordering based on physical charcteristics, and by structuring time and space. Further, these young children are assumed to be functioning on a concrete level and, although beginning to use symbols, unable to make strictly mental manipulations (Lavatelli, 1973). Preoperational children are very intuitive (Weikert, 1974), their cognitive abilities limited by their ability to focus only on one physical characteristic at a time, a behavior called centering. Further, children between the ages of four and seven, Piaget states, have "...few intuitions capable of articulation" and are incapable of "generalization and reversibility" (1962, p.233). Only when children begin to move into a transitional stage, a period linking the preoperational and concrete operational stages, are they able to consider multiple aspects of a situation and to consider relations among stimuli (White, Alexander, & Fuqua, in press).

PIAGET'S THEORY AND TEACHER EDUCATION

Because Piaget is "...the most widely known name in research of the development of human thinking and cognition" (Hittleman, 1978, p.52), it is not surprising that he has had a great impact on the content of courses preparing elementary teachers. An informal review of 35 textbooks used in undergraduate teacher education programs revealed that Piaget's contributions are touched upon in educational psychology and early childhood introductory courses and science, social studies, math, and reading methods courses[1]. Of these 35 texts, 29 discussed Piaget's theory, most focusing on the stages and characteristics of children falling within each of these stages.

Descriptions of the preoperational child revealed such terms as confused (Hildebrand, 1975; Seefeldt, 1977), erratic and inconsistent (Jackson, Robinson, & Dale, 1977), irrational and illogical (Cain & Sund, 1980), disorganized, inaccurate and incomplete (Seefeldt, 1977). Seefeldt (1977) states that to preoperational children

"...a red square is red; therefore, it cannot be a square" (p.18), and warns of the danger of presenting concepts too early.

The picture that emerges is one of a young child extremely limited in reasoning ability (Blank, Rose, & Berlin, 1981); a child who is basically "cognitively inept" (Gelman, 1979, p.902). This view of the young child, ages two to seven, becomes especially significant when it is presented to undergraduate education majors over and over in their teacher preparation program.

A few examples may suggest some of the thinking which might result from this. Experience with undergraduate students going through a microteaching program revealed that students preparing to teach kindergarten felt that higher order questions were inappropriate for five-year olds. They viewed five-year olds as unable to analyze, synthesize and evaluate information and situations. To another student, one semester away from kindergarten student teaching, asking for approaches to classroom management, it was suggested that children be provided with alternatives and be allowed to choose between them. The student was surprised and skeptical of the suggestion, for in one of her courses she had learned that "five-year olds can't make decisions."

Whether or not we intend for undergraduate students to interpret the information presented in this way, the picture they are getting is one of a child of limited cognitive ability. These preservice teachers then interpret this as an inability to think and to make decisions. Although several authors point out that children progress through the stages at different rates, this point is not stressed. Rather, characteristics of each stage, for which Piaget is probably most well-known (Hunt, 1982), seem to be most prominent.

NEO-PIAGETIAN RESEARCH

The overriding image of the preschooler being presented to undergraduates, then, is one of a very dependent, illogical and irrational creature. In fact, the characteristics of four- and five-year olds may be much broader, their cognitive skills much more sophisticated and the ages at which these skills appear much more varied than is implied by the literature.

Some of those questioning Piaget's theory wish to reject it as "more of a hindrance than a help" (Hunt, 1982, p.210) in understanding cognitive development. Others, calling themselves neo-Piagetians, are examining the stages and suggesting, not that they do not exist, but that they may be much less "simple and straight forward" (Flavell, 1971, p.45), with much more heterogeneity within each stage than was previously suggested (Flavell, 1982; Kitano, 1982). Researchers like Pascual-Leone (1969), Flavell (1982), Fischer (1980), Gelman (1979), Vosinadou and Ortony (1983) are adding to the theory. Their research is showing heterogeneity within each stage and heterogeneity within each child (Noddings, 1983), and is indicating that a child may perform differently on different types of tasks. They are demonstrating the presence of abilities in young children which, according to Piaget, should not be present at all (Hunt, 1982).

Richards and Siegler (1981) supported this trend in their research which found three- to five-year olds able to adopt problem-solving strategies and apply rules when working with familiar objects in familiar settings. Blank, Rose and Berlin (1981) found

some three-year olds able to solve prediction problems, some four-year olds able to not only solve prediction problems but to explain their strategies, and many five-year olds capable of solving and explaining prediction problems. Others have looked at specific strategies among young learners (Brown, 1977; Flavell, 1981; Garner, 1981) and at the acquisition of these strategies (Brown, Bransford, Ferrara, & Campione, 1982).

ANALOGICAL REASONING IN YOUNG CHILDREN

The present study adds to the neo-Piagetian literature with an investigation of four- and five-year olds' analogical reasoning ability. Analogical reasoning was selected because research has associated it with reading performance (Alexander & White, 1983; Rumelhart & Ortony, 1977; Sternberg, 1977), has demonstrated its trainability among school-aged children (Alexander, White & Mangano, 1983), and has shown its utility in linking knowledge learned in one domain with knowledge learned in another (Vosniadou & Ortony, 1983).

It is also important to look at analogical reasoning abilities specifically in young children. Vosinadou and Ortony (1983) noted that analogies are almost completely absent from elementary textbooks. This may be because preoperational children and those in transition to the concrete operational stage (approximately 2 to 7 years old) are assumed be unable to decenter (Piaget, 1962), to consider multiple characteristics and unable to do the "if-then" thinking necessary to analogical processes (Carin & Sund, 1980). Gentner's (1977) research, however, suggests that young children may be able to apply analogies as well or better than do adults.

The current study incorporates the component processes of analogical reasoning as outlined by Sternberg (1977) into a game-like format using familiar materials, as suggested by Gelman (1979), to further assess analogical reasoning ability in four- and five-year olds. Specifically, the investigation tested the following questions:

1. Is there evidence of analogical reasoning in four- and five-year olds as demonstrated by their performance on an analogy task?
2. Are there differences in the performance of four- and five-year olds on the analogical reasoning task?

METHOD

Subjects

Twenty children, 10 four-year olds and 10 five-year olds, were randomly selected from a group of children enrolled in a private, church-affiliated day school in College Station, Texas. The four-year olds ranged in age from 4.2 to 4.10, with a mean age of 4.5. The five-year olds ranged in age from 5.0 to 5.8 with a mean age of 5.6. Twelve males and 8 females were tested.

Materials

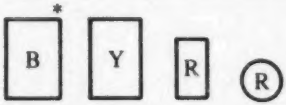
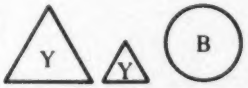
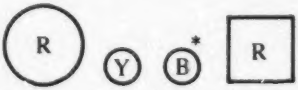
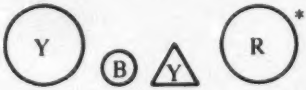
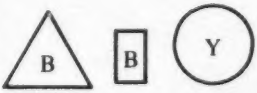
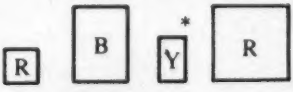
Colored attribute blocks, common to preschool and primary classrooms, varying

along the dimensions of color, shape, and size were used. A four-inch by 24-inch gameboard, consisting of four white-framed boxes, separated into pairs by a white divider was designed for the task.

The analogy "game" consisted of 16 items of increasing complexity. For each item, the investigator placed two blocks in the first two squares of the gameboard and a third block in the third square. Four blocks were then placed along one side of the gameboard. These blocks, from which the child made a selection to complete the analogy, included the correct choice, a block differing by one attribute, one differing by two attributes and one differing by three attributes. Several test items are illustrated in Figure 1.

Figure 1

ANALOGICAL REASONING TASKS

Item No.	Item*	Choices**
1		
3		
7		
13		

*B = blue, Y = yellow, R = red

**Choices presented to children were in a vertical format. The correct response for each item is starred.

Procedures

Each child was individually tested by one of the investigators, while another coded verbal and non-verbal behaviors and another videotaped the session. Testing took place in a classroom close to the child's room and time was taken prior to the testing to establish rapport, inform the child about the equipment and other persons in the room, and put the child at ease. The following directions were then provided to each child:

> Today, we will be playing a game and in this game we have a gameboard (pointing to the board) and different pieces that go on the board (holding up attribute blocks). When we play the game, I am going to take different pieces and put them on the board like this (holding up blocks used in item one). Each time we play the game I am going to put a piece here (inserting block in first box), here (placing block in second box), and here (inserting block in third box), but I am not going to put a piece here (indicating the fourth box). What you have to do is to choose the piece from over here (pointing to the choices vertically arranged at the right) that you think should go in this box (pointing to the fourth box). Now, the way you decide is to look at this piece (first block), and this piece (second block) and see how they go together. Then, you look at this piece (third block) and find the piece from over here (pointing to the choices) that goes with this one (third block) the way these two (first and second blocks) go together.

Directions to attend to the relationship of the first two blocks in making their selection were repeated between each item. No other cues were given. After a selection was made, the child was asked to explain the choice and why various other blocks were not selected.

Results

In response to the research question, test results indicated analogical reasoning abilities to be present in four- and five-year olds. Two children responded correctly to all 16 items, while another answered 15 of the 16 items correctly. For this task, these children appear to be performing at a concrete operational stage.

Other children demonstrated performance characteristic of children in transition from the preoperation to the concrete operational stage. Four of the four-year olds and two of the five-year olds responded correctly to 11 of the 16 items, indicating an ability to attend to relationships across pairings. For those children demonstrating centering behaviors, characteristic of Piaget's preoperational stage, color appeared to be the most salient attribute. Abilities to explain choices varied considerably, even among those demonstrating analogical thinking. Raw scores, means, and standard deviations for four- and five-year olds on the analogy task appear in Table 1.

These results counter research of Piaget, Montangero, and Billeter (1977) which suggested that analogical reasoning develops from about eight to 11 years of age and that only children around 11 years of age can explain their reasoning.

Data analyzed with respect to the second research question indicated a difference in the performance of four- and five-year olds, and a significantly greater range of scores for five-year olds than for four-year olds.

IMPLICATIONS FOR TEACHER EDUCATION

It seems essential that research on the cognitive capabilities in young children be

Table 1

RAW SCORES, MEANS, AND STANDARD DEVIATIONS FOR 4 AND 5 YEAR OLDS ON THE ANALOGY TASK

	Four Year Olds	CA	Five Year Olds	CA
RAW SCORES	11	4-9	16	5-8
	11	4-10	16	5-5
	11	4-9	15	5-6
	10	4-2	11	5-0
	9	4-10	11	5-6
	8	4-5	8	5-2
	7	4-4	8	5-8
	7	4-9	7	5-7
	7	4-6	6	5-8
	6	4-8	6	5-6
MEAN	8.70		10.40	
SD	1.95		4.03	
VARIANCE	3.80		16.03	

continued, thereby replicating findings of previous studies and expanding our understanding of thinking and reasoning abilities of this special population. For example, in a study presently underway (Alexander, Willson, White, & Fuqua, 1984), preliminary data replicate the findings of the current investigation by providing evidence of analogical reasoning abilities in four- and five-year olds.

What existing neo-Piagetian research does suggest is that Piagetian stage theory may not provide the definitive framework for determining the cognitive potential of young children. Rather, the characteristics and capabilities of young children, ages two to seven, may be much more variable than previously thought. Educators need to know that some children, on some tasks, presented in certain ways, are capable of solving problems previously thought to be too complex or inappropriate.

As the survey of undergraduate methods texts indicated, students are repeatedly exposed to the theory of Piaget, with an emphasis on the stages and characteristics of children in each stage. This exposure cannot help but influence preservice and inservice teachers' expectations of young children, which in turn may limit instructional approaches used in early childhood classrooms. In a reiteration of the Pygmalion effect, if teachers act toward young children in accordance with limited expectations, then children will begin to appear more homogeneous then they really are. In other words, the cognitive potential of young children must be stressed in teacher education rather than presented as after thoughts as does Seefeldt who, after a restrictive description of the preoperational child, offhandedly notes that these children, "however . . . do use the processes of thinking" (1977, p.234).

Neo-Piagetian research on young children must become an essential component in early childhood/elementary education programs. Preservice teachers need to be ex-

posed to the neo-Piagetian literature that demonstrates young children's potential for higher level thinking. These future teachers need to understand that they are likely to encounter preschoolers who function beyond the preoperational level. They need to see the "big picture" in cognitive development so that they can assist those children who are ready to progress, to think, to experiment, and to discover relationships. They should be made aware that some five-year olds do know that a red square is both red *and* a square. They need to know that many higher level concepts presented appropriately are valid for preschoolers, and may not be as incomprehensible for the child and as "futile" for the teacher as some (e.g., Morrison, 1980) would lead us to believe.

If instruction is to be positively affected, however, materials and strategies employed in the instruction of young children must be reevaluated in light of our increasing understanding of the cognitive capability of the preschool population. Materials and strategies widely used in our preschool and primary schools may well prove less than challenging to many young children who possess higher-order reasoning abilities. Further, teachers need to be presented with specific methods and materials that would be effective in teaching reasoning skills to young children. To illustrate, higher-order questioning skills should be emphasized. Also, techniques for assessing and teaching reasoning skills to children need to be developed, employing tasks which are ecologically-valid (i.e., familiar to and appropriate for the age and interests of the students).

All these implications become even more crucial when one considers the vast number of young children participating in pre-Kindergarten programs. If the present trend continues, more and more two-, three- and four-year olds will be spending a portion of the work-day in some form of pre-Kindergarten program. Various states, Texas among them, are even considering legislation that would mandate academic programs for pre-Kindergarten children (Select Committee on Public Education, 1984).

It becomes clear that teacher education must begin now to develop quality programs that will produce instructors who possess an accurate understanding of the cognitive potential of young children and who are able effectively to meet the needs of these children. It is also clear that such quality programs must incorporate a more flexible view of thinking and reasoning abilities of young children than that which is generally being espoused. If they are to prove successful, programmatic changes must begin with a recognition that young children, far from being "cognitively inept", are "cognitive capable" learners worthy of the attention of teacher education.

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[1]A complete listing of the texts reviewed in this study is available upon request from the first author.

WHO ARE THE TEACHER EDUCATION STUDENTS?

Tom V. Savage

THE PROBLEM

The quality of students entering teacher education programs has long been a concern. Recent reform movements have focused new attention on the problem while implying that the quality of individuals entering teacher education programs has experienced a marked decline. Weaver (1979) highlighted this concern and claimed that this "brain drain" was one of the most serious issues confronting teacher education. The implications seem clear, education is not attracting academic talent and something must be done to correct the situation.

What are the characteristics of those choosing teaching as a career? Has there been a decline in the quality of those choosing teaching? While assertions are many, studies investigating this issue are few. The intent of this paper will be to review those studies that have addressed these questions and identify isues and research needs for future study.

MEASURES OF ACADEMIC ABILITY

One of the major issues related to the answer of these questions centers on the identification of appropriate measures of academic quality. The measure that has been used most often is the Scholastic Aptitude Test (SAT). Most studies report SAT scores for students entering teacher education programs and compare them with students entering other academic disciplines. However, the predictive validity of the SAT has been questioned (Trusheim & Crouse, 1982). On the other hand, Vance and Schlecty (1982) defended their use of SAT scores on the grounds that SAT scores are politically significant. Their assertion is that the SAT score is an indicator that is understood by the public and cannot be ignored. Weaver (1979) reinforces this argument by stating that an empirically verified relationship between measures such as the SAT and teaching ability is immaterial. His argument is that it is a reasonable requirement to expect teachers to be literate. His assumption seems to be that the SAT is a valid measure of literacy. However, this assumption has not gone unchallenged.

Bejar and Blew (1981) reported low correlations between the two SAT subscores and freshman grades. The correlation with the verbal portion was determined to be only .31 for males and .38 for females. While the correlations with the math portion was somewhat higher, .35 for males and .41 for females, neither set of correlations is high enough to engender a high degree of confidence in the test as a measure of academic ability. The question then, is whether conclusions concerning the qualifications of those entering education ought to continue to be based on measures that have gained popular acceptance but seem to have questionable validity? If real improvement is desired rather than the illusion of improvement, it would seem desirable to identify

indicators that do have validity in terms of basic literacy as well as some relationship to teaching performance.

Another potential indicator of academic ability is the high school grade point average. College admission officers report that high school grades appear to be the best predictor of success in college. Trusheim and Crouse (1982) used a sample drawn from the National Longitudinal Study for the class of 1972 to investigate the predictive validity of the SAT and high school grades. They reported the SAT added virtually no information to high school grades in predicting either freshman grades or the eventual attainment of a college degree. Bejar and Blew (1981) reported higher correlations for high school grades than SAT scores with freshman grades. These data suggest that high school grades are at least as important, if not more so, as an indicator of academic ability than SAT scores. Perhaps this is because high school grades are indicators of study habits, task persistence and motivation, characteristics that are important in college success but not measured by the SAT.

SAMPLING THE POPULATION

Another issue related to the identification of characteristics of those entering teaching relates to the point at which the population is sampled. Some conclusions regarding the academic characteristics of those choosing education as a career are based on the SAT scores of high school seniors who report that they plan on pursuing teaching as a career (Weaver, 1979). However, Lyson and Falk (1984) reported that 75% of the students surveyed in the National Longitudinal Study of 1972 who planned on becoming teachers had not done so by 1979. Most of the individuals who had actually entered teaching had originally reported an interest in another professional field.

An analysis of data by the Texas A&M Measurement and Research Office further illustrates the issue. These data revealed that over a two year period only 43% of the 715 who received degrees in education were initially enrolled as majors in education. Obviously, there is a great deal of movement from one major area to another during the college years.

At what point can students be sampled in order to determine the characteristics of those entering education? It seems apparent that conclusions based on the stated preferences of high school seniors or even those of college freshmen are of questionable value. Data must be gathered closer to the time when an individual actually enters teaching. An issue often overlooked when sampling the academic qualifications is the identification of students who are not education majors yet who plan on becoming teachers. Most of the studies compare students who are education majors with those who major in other academic areas of study. This sampling overlooks the fact that many of the students who are interested in secondary teaching actually major in fields other than education and take education courses as a means of obtaining certification. Therefore, reports on the academic qualifications of teachers which report conclusions based only on those enrolled as majors in education are missing an important segment of the population of future teachers. Unfortunately, this point is often overlooked in reports on the quality of those entering teaching. Those choosing to teach a particular

subject in the secondary school may or may not differ from others majoring in that same subject. Merely comparing majors does not reveal this information. Perhaps an analysis of those who student teach or those who apply for certification would provide more meaningful data.

REVIEW OF RESEARCH

What is known about the characteristics of those entering teaching? Several studies have addressed this issue. Most have relied on the SAT as an indicator of quality and have compared those entering education with those entering other disciplines. Therefore, the issues addressed above should be kept in mind when reviewing this research.

Several researchers have used the population of the National Longitudinal Study (NLS) as a basis for their research. While these data are useful, it must be remembered that this data set is based on the high school class of 1972. Drawing conclusions concerning the characteristics of students currently entering education based on a data set gathered over a decade ago is of limited value.

One of the first to use the NLS data was Weaver (1979). He compared those graduating with degrees in education with those obtaining degrees in other subjects. In a ranking of sixteen subject areas by SAT averages, those graduating in education placed fourteenth. He concluded in this study that education was attracting academically inferior students and was less selective in screening students during their college program than other disciplines.

Further, Weaver examined the placement of those who were able to obtain employment as teachers. He found no correlation between those who were eventually employed as teachers and their SAT scores. Considering the lack of predictive validity of the SAT it would be surprising if the SAT were a predictor of employment. Rather, this finding supports the argument that the SAT is of limited value in determining the quality of future teachers.

Vance and Schlecty (1982) mined the NLS data for the SAT of graduating college seniors and those who actually taught between the years 1976 and 1979. They divided the population of graduating seniors into five ranks according to SAT scores. They reported that fewer education graduates were from the top rank and more were from the bottom rank than for the seniors who did not major in education. They, like Weaver, reported that the hiring process did not favor those with higher SAT scores. Furthermore, they reported that fewer of those drawn from the higher SAT ranks actually taught or intended to continue teaching until age thirty. Their conclusion was that those with high academic ability were more likely to leave teaching than those with low academic ability. While some concern may be warranted, basing this conclusion entirely on SAT scores appears to be a case of extrapolating beyond the data.

Lyson and Falk (1984) also used the NLS data in their study and found that about half of the individuals teaching in 1979 did not report teaching as an interest in 1972. As cited earlier, they also found that 75% of those who had stated an intent to teach were not doing so seven years later. They concluded statements of expectations by high school seniors are not reliable indicators of future occupational attainment.

In addition, Lyson and Falk analyzed those who defected from teaching as a career choice and those who switched to teaching from another professional career category. They discovered that over 50 percent of those who stated an intention to teach were not employed in a professional or managerial position. They hypothesized that teachng might be identified as a career choice by many high school seniors of limited academic ability because they were unaware of the difficulty in completing a teacher education program. This hypothesis runs counter to the Weaver inference that teacher education programs lack selectivity. Lyson and Falk contend that completion of a teacher education program is not as easy as some critics suggest and is indeed, screening out those with limited academic ability.

Gallegos and Gibson (1982) used a different approach in attempting to assess the quality of teaching candidates. They compared the high school grade point average, lower division college grade point average and college graduation grade point average of students graduating with degrees in education separated by a decade. Their intent was to determine whether or not there had been a decline in the quality of those choosing education as a major. They selected 150 education graduates from the classes of 1979, 1980, and 1981 and compared them with 149 education graduates from the classes of 1969, 1970, and 1971. After controlling for grade inflation, Gallegos and Gibson found a significant difference between the two groups in favor of the most recent graduates. Their conclusion is exactly the opposite of that claimed in much of the recent literature. They concluded, at least for the university they studied, that the academic qualifications of those choosing education as a major had actually improved in the last decade.

Savage (1983) limited his investigation of those entering teacher education programs to women who were choosing education as a university major. The purpose of the study was to investigate the impact of increased opportunities for women on the quality of women entering teacher education. This study, like several others, used the SAT score as one measure of academic qualifications. However, high school class standing was added as another indicator of academic ability. The study was a longitudinal study that investigated the characteristics of women choosing to major in seven selected areas of study at the beginning of each of the four undergraduate years. The SAT scores and high school class standing were averaged for all women enrolled in each of the seven areas of study at the beginning of the freshman, sophomore, junior and senior years. Since the same group of women were followed for the four years in question, this procedure identified shifting patterns in the population that could be attributed to transfers and drop-outs.

Throughout the four year period women choosing education as a major ranked sixth of the seven areas in terms of SAT averages. The greatest difference between the women choosing education as a major and those choosing other majors was on the math component of the SAT. There was a 105 point difference between women choosing education and women choosing engineering as majors.

The patterns presented by the shifting population was of interest. At the beginning of the junior year the SAT averages for women majoring in education jumped by 22 points. The only majors that had a greater increase than 22 points over the entering freshman averages were in engineering and science. However, in the intervening two years the attrition of women in these two majors was quite high. Science dropped from

413 women in the freshman year to 108 in the junior year. Engineering dropped from a high of 225 in the freshman year to 168 in the junior year. No doubt some of this attrition was due to a screening out of those who did not have the aptitude for the subject.

Education majors decreased by only four students between the freshman and junior years. While an initial impression might be that this indicates that teacher education is not selective, this would not be accurate. Further analysis of the data reveals that there was, in fact, a drop of 35 women from the freshman to sophomore years. There was then an increase of 31 women from the sophomore to the junior years. There was considerable change in the population of students majoring in education from the sophomore to the junior years. The fact that SAT scores and the high school class standings increased by the junior year indicate that a number of women with low SAT scores and high school class standing were dropping out of the program and were being replaced by students with higher scores. This observation lends additional support to the Lyson and Falk hypothesis that high school students choosing education as a major were unaware of the difficulties involved in completing education requirements. Furthermore, this observation casts doubt on the oft stated assertion that academically talented students drop education because of the lack of intellectual challenge. Rather, the opposite appears to be the case. Students with higher academic qualifications are attracted to education.

A second quality indicator, that of high school grades, was investigated by Savage. High school class ranking was averaged for all of the women in each of the areas of study and was recalculated for the population of women in each of the four college years. At the freshman year education as a major tied for last place in a comparison of the seven majors. However, similar to SAT score trends, the averge high school class rank of those in education at the junior year increased. The increase in average high school class rank was twice that of any other major and placed education in the middle of the distribution of the seven areas studied. These findings lend support to the hypothesis that women with higher academic qualifications were transferring into education at the conclusion of the sophomore year. Given the evidence of higher predictive validity for high school grades, this increase in average high school class rank would appear to be an item of major importance when drawing conclusions about the quality of women choosing education as a major. Lyson and Falk (1984) developed a profile of those who were most likely to enter teaching. They noted that white women who did well in high school were candidates most likely to enter teaching. These observations would seem to be of major importance in any analysis of the characteristics of students entering teaching.

In an attempt to discover reasons for the shift of women with high indicators of academic qualifications into education, a number of interviews were conducted with women who transferred into education. The reason most often cited by those making the change was a clarification of career choices. Many stated that they had been encouraged by parents and counselors to pursue a career other than education. However, after a year or two in another area they decided that they really wanted to become a teacher. The comment of one woman was revealing. She reported that her high school counselor had said, "You are a bright girl, be something, don't be a teacher."

CONCLUSIONS

What conclusions can be drawn concerning the quality of individuals choosing education as a career? Any conclusions that are drawn must be tempered with a consideration of the limitations of the data presented. There is some indication that education is not attracting the highest quality student. However, it is unlikely that education has ever attracted the top student. The Gallegos and Gibson study indicates that the quality of students choosing education might have actually improved, rather than declined in recent years. The Savage study gives credence to the concern that academically talented women may now be choosing majors other than education. There is cause for concern concerning the quality of students entering teaching. Programs designed to improve the quality of education must address ways of attracting talented students into education. However, the sitution does not appear to be as bleak as popular reports indicate. Education is attracting many students of high academic quality. It is important this fact be emphasized. The public impression seems to have been created that all students entering education are of inferior academic quality.

It is evident that there is much needed research in this area. One of the first tasks that needs to be addressed is the identification of adequate indicators of quality. Those that are receiving popular attention appear to be woefully inadequate. The reliance on SAT scores must be replaced with more valid indicators. The data would suggest that grades should receive more attention. Perhaps some of the recent competency tests will prove to be indicators of value.

It is obvious that a great deal of research is needed in this crucial area. Policy decisions of considerable importance are being made. In order to bring about the improvement that is desired, these decisions need to be made on the basis of empirically derived generalizations, not unfounded assumptions.

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A COST-EFFECTIVENESS EVALUATION IN TEACHER EDUCATION

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Traditionally, educational researchers and evaluators have examined only the effects of programs, with little attention to cost. Conversely, administrators have often examined costs without relating them to program effectiveness. Treating outcomes without attention to costs can result in decision makers selecting program alternatives that are only marginally more effective, but exorbitantly more expensive than other alternatives. However, treating costs without consideration of outcomes results in knowing which of several alternatives is least expensive, without knowing whether that alternative produces the desired outcomes. Only by combining both costs and outcomes can one reliably determine which alternative is most effective for a given cost, or how much it would cost to obtain a desired level of effect (Denton & Smith, 1983).

There are three primary techniques which enable one to combine both costs and outcomes in a single study: cost utility analysis, cost benefit analysis, and cost effectiveness analysis.

Cost-utility analysis involves the evaluation of alternatives through a comparison of their costs and the estimated value of their outcomes. One can integrate multiple outcome measures into a single value, but because the measures and analysis are hypothetical, the results are generally not replicable. This form of analysis is useful as a planning tool for administrators, or as a device to aid in group discussion of possible program effects, but provides a weak basis for making programmatic decisions (Levin, 1983).

Cost-benefit analysis provides replicable results and enables one not only to compare alternatives for a given program, but to compare across programs which have different classes of outcomes. Because all outcomes are expressed in terms of dollar benefits, one can compare reading programs with counseling programs with athletic programs. The major problem with using cost-benefit analysis in programmatic evaluations is that it is frequently very difficult to assign monetary values to program outcomes. Since any dollar value assigned to such outcomes as increased music appreciation, reading comprehension, self-confidence, and computer literacy are highly questionable, cost-benefit studies frequently have little credibility with local administrators (Levin, 1981).

Cost-effectiveness analysis consists of representing program outcomes not in terms of monetary units, but in terms of other effectiveness units such as reading scores, attitude scale scores, and behavioral rates. Effectiveness units consist of the standard outcome measures currently used in educational evaluation. Because one does not convert all outcomes to the same unit (dollars), one cannot use cost-effectiveness analysis to compare across programs (e.g., to compare reading programs to athletic programs). Comparability across programs is not usually problematic, however, since such comparisons have historically been of less interest in educational evaluation than

comparisons within program alternatives, such as which of two instructional stategies most effectively improve reading scores. Of the available techniques, therefore, cost-effectiveness analaysis would seem to be the treatment of choice for use in educational program evaluation at the managerial or administrative level (Levin, 1981).

A few writings designed to help researchers use cost-effectiveness analysis in program evaluation do exist. Alkin (1970) provided an early chapter advocating its use in the evaluation of instructional prgorams. Levin (1975) provided a sound general introduction to the topic, followed by an instructional analysis of specific applications in educational evaluation (Levin, 1981, 1983). Thompson (1980) also discusses the use of cost-effectiveness in his volume on benefit-cost analysis in evaluation.

A cost-effectiveness analysis thus involves the comparison of two or more program alternatives which can be compared on similar outcome or effects measures such as test scores, performance ratings, and so on. The incorporation of cost data enables one to consider the interplay of both costs and effects in reviewing program operations.

The Present Study

While there have been a number of studies of the effects of two Texas A&M alternative programs leading to secondary teacher certification (cf. Denton, 1980, 1981; Denton & Lacina, 1984; Denton & Morris, 1981; Denton, Morris & Tooke, 1982; Denton & Norris 1979, 1980, 1981) there has, as yet, been no attempt to combine these effects information with program costs. That was the intent of this study.

The present investigation seemed warranted for several reasons. First, previous effects studies have suggested that important differences exist between the two alternative preparation programs. Having more professional education courses seems to improve a student's teaching ability, but how expensive is the increased performance to the student, the department, and the college? Second, there is currently an ideal opportunity available to study the relative costs and effects of the two programs since there exist "natural" comparison groups which have participated in the in-place and stable program alternatives. In other words, a natural comparative design already exists. Finally, since future changes to the teacher preparation program are being contemplated, including the possibility of an extended program, the time is right to do some preliminary study of the costs of the existing alternatives. Although the present study does not address the potential effects or costs of possible future alternatives, the results of this investigation should provide useful background, and possibly suggestive, information for use in designing future alternatives.

The purpose of the study reported here was to conduct an exploratory investigation into the major costs to the college of education in providing the "education-major" alternative to obtaining teacher certification. The present work does not represent a complete, definitive study of all program costs and effects. It provides information that we believe to be sound, but at this point only suggestive. We anticipate that programmatic questions may arise that would require a more detailed analysis than we have been able to provide here.

The study reported here was conducted between May and July of 1983. The basic

procedures consisted of identifying appropriate cost categories and gathering the required cost information. Major effects data from previous studies were reviewed, summarized for inclusion in this report, and then the relationships between program costs and program effects were investigated.

DESCRIPTION OF THE ALTERNATIVE PROGRAMS

Program Rationale

This investigation was conducted under the auspices of an educational curriculum and instruction (EDCI) department at a land grant university. The teacher preparation programs which were studied in the investigtation are competency based programs for secondary level teachers fashioned around a diagnostic prescriptive model of instruction (Armstrong, Denton, & Savage, 1978). This model conceptualizes teaching as a series of events requiring five distinct sets of instructional skills, that is: Specifying Performance Objectives, Diagnosing Learners, Selecting Instructional Strategies, Interacting with Learners, and Evaluating the Effectivenss of Instruction.

This model provides a framework that encourages the development of individual teaching styles. Individualized styles are encouraged because evaluation of instruction is based on learner attainment of performance objectives. Given this operating principle, teachers in preparation are free to choose procedures from their own repertoires that they believe will result in high levels of learner performance. Further, teacher responsiblity is well served by this model. This responsibility comes not because of the teaching candidate's adherence to a set of "ideal role behaviors," but rather in adapting instructional practice, as necessary, to help learners achieve performance objectives that have been selected.

Program Course Offerings

In contrast to the commonalities among the two teacher preparation programs, in teacher education, the most pronounced difference between individuals majoring in education and non-majors seeking teacher certification while completing degree requirements in agriculture, liberal arts, or science is the required semester hours of professional education coursework. Non-majors complete 22 semester hours of professional education couresework, while majors complete 34 semester hours. In addition, each program requires a minimum of 48 semester hours of teaching field coursework. The following table illustrates the professional education coursework required for both programs.

The primary cost analysis question in this inquiry is the cost effectiveness of the additional 12 semester hours in education required of education majors. On the cost side, because 5 additional courses are required, offering this program is more expensive for the college than providing the certification program. On the effects side, the education major program is more effective in producing pupil cognitive gains during student teaching than is the certification program, yet supervisor ratings and self-report morale ratings of student teachers are essentially equal across the two programs.

Table 1

PROFESSIONAL EDUCATION COURSEWORK REQUIRED BY SECONDARY TEACHING CANDIDATES IN ALTERNATE PREPARATION PROGRAMS

Semester	Major in Education Program	Certification Program
Second	EDCI 120 Introduction to Teaching (1 hr)	-----
Third	EDCI 220 Early Field Experience (2 hr)	-----
Fourth	EDCI 221 Subject Matter of Teaching (3 hr)	-----
Fifth	EPSY 301 Educational Psychology (3 hr)	EPSY 301 Educational Psychology (3 hr)
Sixth	EDCI 323 General Methods of Teaching (3 hr)	EDCI 323 Gen. Meth. of Teaching (3 hr)
	EPSY 321 Adolescent Psychology (3 hr)	-----
Seventh	EDCI 401-7 Teaching Field Meth. (4 hr)	EDCI 401-7 Teaching Field Meth. (4 hr)
	EDTC 405 Preparation of Instructional Materials (3 hr)	-----
Eighth	EDCI 425 Student Teaching (12 hr)	EDCI 425 Student Teaching (12 hr)

Since the argument in favor of the additional 12 semester hours of professional education coursework is that the additional coursework is worth the additional cost to the college, let us review the differences in methods and field experiences between these two programs.

All students in both secondary education programs are required to successfully complete the following courses:

EPSY 301: Educational Psychology: (3 sem. hrs.)
This course examines the role of psychology in addressing problems of teaching. Topics include: nature and operation of principles of learning; transfer of training; nature, measurement and significance of individual differences; and conditions influencing efficiency of learning.

EDCI 323: General Methods of Teaching: (3 sem. hrs.)
This course focuses on planning and directing instructional activities, through emphasis on classroom management; development of performance objectives; techniques of presentation; instructional diagnosis; and evaluation and marking.

EDCI 401-7: Teaching Field Methods: (4 sem. hrs.)
These courses address the scope and sequence of contemporary junior and senior high school language arts, social studies, science and mathematics. General principles and methods of teaching these content areas are addressed and practiced through micro-teaching experiences.

EDCI 425: Student Teaching: (12 sem. hrs.)
Supervised teaching experience for a full semester in a junior high school or senior high school.

In addition, students majoring in secondary education complete the following courses and resulting experiences:

EDCI 120: Introduction to Teaching: (1 sem. hr.)
This course is devoted to the discussion of the purposes of education including the contributions of the social sciences to education. Further, basic concepts for curriculum and instruction are addressed as well as the requirements for entering the profession.

EDCI 220: Early Field Experience: (2 sem. hrs.)
This course examines various aspects of teaching and teacher roles. Weekly classroom observation and participation in laboratory periods are central components of this course as well as on-campus lecture periods which are devoted to teacher values, personality, student learning problems, and teacher involvement in professional organizations.

EPSY 321: Adolescent Psychology: (3 sem. hrs.)
This course examines adolescent growth and development, placing special emphasis on adolescent behavior in secondary schools. Influences of prior development, home, family, community, and peer groups are examined in relation to their influence on the adolescents' adjustment.

EDTC 405: Preparation of Instructional Material: (3 sem. hrs.)
The course provides theoretical and practical aspects of the study of communication with emphasis on technological aids. Laboratory experiences in the selection, preparation, use and evaluation of instructional materials are provided by this course.

While the number of hours of coursework obviously differ, the sequencing of courses also differs. Education majors are engaged in professional education coursework over seven semesters, while teaching candidates in the certification program complete the professional education sequence in four semesters. Faculty in secondary education are cautious but willing to venture that it is the sequence of the professional education coursework over an extended period of time that is influencing the effects outcomes. Only through protracted contact with pedagogical knowledges and skills do teaching candidates come to consider such knowledges and skills to be vital and worthy of serious consideration. Often students in their initial education courses resort to "memorizing" principles of teaching with little thought about these principles guiding their behavior as teachers. Yet this thought does occur somewhere during the program, and substantially different strategies appear to be practiced by candidates who have come to realize that principles of teaching may actually be of value to them as teachers. It may be that, due to the increased time of contact with pedagogical content, education majors do internalize more of the principles of teaching than candidates completing the briefer certification program.

DESCRIPTION OF EFFECTS

As described previously, two alternative programs exist for students desiring to

obtain secondary teacher certification. How do these alternatives compare in terms of instruction effects? Is one alternative more effective in producing the desired student gains than another? These are the basic effects questions.

The culminating experience for both preparation programs is a full-semester, full-day student teaching program with twelve semester hours being awarded for successful completion of the experience. During this course, each student teacher is required to develop and implement two instructional units, each requiring approximately two weeks to complete. The instructional units are to include: performance objectives, a diagnostic pretest to determine if prerequisite knowledges and skills are present, instructional strategies addressed to each performance objective, and criterion-referenced instruments. These units must be approved by the classroom supervising teacher and the university supervisor prior to implementation. Some time ago, a multi-stage evaluation system was established to monitor the development and implementation of these competency-based programs (Denton, 1977). Evaluation of student teachers in this system includes supervisor ratings based on in-class observations and ratings of instructional materials produced by the student teacher. Generally, six supervisor visits are completed during a semester. These visits are recorded as ratings on an *Evaluation Profile* instrument. It may be of significance that the final evaluation for each student teacher recorded on this instrument represents a consensus rating resulting from a three-way conference between the student teacher, the classroom supervisor, and the university supervisor. In addition, a *Curriculm Context Checklist* for rating the components of each instructional unit is completed by the university supervisor. Two of these forms are completed during the field experience. These rating scales provided effects data for this inquiry. In addition, summative procedures are conducted by student teachers at the conclusion of each unit, and summaries of learner performances are recorded on *Summary Evaluation of Unit Forms*. Values for this form are obtained as student teachers retain the unit test responses of learners after providing feedback to them regarding their performances. Copies of these instruments are available in ERIC (Denton & Norris, 1979).

The aforementioned learner performance data were subsequently used to develop a criterion-referenced summary on each learner and summarized as group values for each student teacher. Subsequent analysis of these data revealed differences in performance among learners depending on the major of the student teacher (Denton & Norris, 1979; Denton & Tooke, 1982) which in turn, simulated this inquiry.

Sample

Information from 82 secondary-level student teachers and 9001 learners taught by these student teachers comprised the total sample for the effects data base. Fifty-five of these student teachers were education majors, while the remaining 27 candidates were teacher certification students majoring in other colleges. The student teachers were supervised by five university supervisors over the course of five semesters (i.e., Spring 1978 - 7 student teachers; Fall 1978 - 18 student teachers; Spring 1979 - 19 student teachers; Fall 1979 - 9 student teachers; Spring 1980 - 29 student teachers). The total number of secondary-level student teachers numbered 291 during this period (Spring 78 - 68; Fall 78 -64; Spring 79 - 52; Fall 79 - 52; Spring 80- 55). Participation of

student teachers in this inquiry was based on whether their university supervisors were actively involved in the research program.

It is important to note that the major of the student teacher was not known by the university supervisor during the field experience. In addition, a contingency table was developed and statistically tested to determine whether student teachers were evenly distributed across university supervisors with respect to their academic majors. This comparison was not statistically significant, indicating expected numbers of student teachers of each category (majors and non-majors) were, in reality, assigned to each university supervisor. Even though these precautions were taken, certainly no claim can be made that educational effects from this inquiry will generalize to other settings.

Upon checking transcripts of this sample, it was determined that the average number of semester hours of former education majors and former certification-seeking students were 144 and 155 respectively. Further, education majors completed 34 semester hours in professional education, while certification students completed 24 semester hours in education. These values roughly correspond to the requirements presented in Table 1.

Results

Because of the numerous comparative studies already conducted on the effects differences between education and non-education majors in these programs, no attempt will be made here to review in-depth all the past research. Instead, we will simply restate the major findings from these studies and refer the reader to the existing technical reports for further details.

One major criterion used to assess the relative performance of the education and non-education majors was the cognitive gain made by their pupils during the student teaching experience. An unexpected finding from this research has been the phenomenon that the academic major of the student teacher appears to account for variation in cognitive attainment of learners of those student teachers. To illustrate, a modest correlation ($r_{pbi} = .23$) was determined between the academic major of the student teacher and cognitive attainment values of their learners on the second unit taught by the student teachers. Further examination of the data revealed that learners of education-majors attained higher average cognitive attainment values ($\bar{x} = 69.0$) than learners of non-education majors ($\bar{x} = 58.9$). These values were somewhat surprising because cognitive attainment means associated with unit one for the two groups of learners were nearly equivalent, 67.6 and 67.3 for learners of education majors and non-majors, respectively (Denton & Norris, 1979).

Another variable, time-allotted-for-instruction, was examined by Denton and Norris (1979) with respect to the major of the student teacher. They report student teachers who were education majors allotted 621 minutes for teaching their initial instructional unit, while student teachers who were non-majors allotted 657 minutes for their first unit. In the case of the second instructional unit presented by the student teachers, education majors allotted 547 minutes to 408 minutes for non-majors. While the allotted time in the first unit was greater for student teachers who were non-majors (approximately a half-period longer), the situation was reversed for the second unit with student teachers who were majors, planning longer units (approximately 2 periods

longer). The findings for unit two are consistent with the teacher-effectiveness research literature because learners of education majors, who attained higher cognitive values, were provided a greater amount of time for direct instruction.

Differences in supervisor ratings of instructional skills between the two groups have also been examined (Denton & Lacina, 1984). For three of six evaluations, ratings by university supervisors during the student teaching experience were found to be significantly different. Ratings of student planning effectiveness showed little variation across the student teaching period regardless of major, although, without exception, the non-majors received higher ratings on the initial instructional unit they presented, while education majors received higher ratings on their second unit. In terms of instructional competence, the differences in ratings between education majors and non-education majors tended to be small. Non-majors consistently obtained higher ratings on the use of duplicating and audiovisual equipment, while majors attained uniformly higher ratings on introducing and concluding lessons. Thus, although the ratings in some cases revealed differences between the two groups, the results were mixed. The supervisory ratings did not uniformly favor one program alternative over the other in terms of instructional skills.

A fifth variable used to study the effects of the alternative programs has been the morale of students during the student teaching process (Denton & Lacina, 1984). In this case, no significant differences have been found between education and non-education majors, suggesting that the programs were equally effective in influencing student morale.

In summary, it appears from previous studies that the education major alternative is more effective in producing pupil cognitive gains during student teaching than is the non-major alternative, that the alternatives are differentially effective in influencing instructional skills as measured by student teaching supervisors, and result in no discernible morale differences during student teaching. In terms of effects, then, the results are mixed, except that the education major alternative seems clearly more effective in producing learner cognitive gain.

DESCRIPTION OF COSTS

Since the nature of this evaluation involved the cost-effectiveness of two secondary teacher education programs at Texas A&M University leading to certification, a series of cost questions were phrased to guide the effort. Because effects data were gathered from 1978-1980, it was felt the comparable cost data spanning 1976-1980 would be appropriate. Thus, cost data over a period of eight semesters were gathered. These evaluation questions phrased from the college's perspective include:

a. What are the administrative costs associated with the alternate secondary teacher preparation programs?

b. What are the management costs associated with the alternate secondary teacher preparation programs?

c. What faculty resources, in terms of cost of teaching coursework, are needed for the alternate secondary teacher preparation programs?

d. What are the costs of materials provided by the college for the alternate secondary teacher preparation programs?

e. What are the equipment costs associated with the alternate secondary teacher preparation programs?

f. What are the costs for the facilities in which the alternate secondary teacher preparation programs are held?

g. What are the costs of services (copy center, computer, mail, telephone) associated with the alternate secondary teacher preparation programs?

Thus, the major cost categories for the evaluation became administration, management, faculty, materials, equipment, facilities, and services. The following paragraphs delineate how the data were gathered and analyzed for each of these categories.

Administration

Two cost items were identified for this category; that is, dean's staff and department head. The dean's staff cost contribution was based on the total budget value multiplied by two ratios. First, total budget allocations for the dean's staff for the period between 1976 and 1980 were obtained from the business affairs official within the college. Second, the ratio of tenure track faculty in EDCI to the total number of tenure track faculty in the college was determined to be .228. This ratio value is thought to represent the contribution of the dean's staff to EDCI departmental affairs. Another ratio used in the calculation was the number of secondary education majors to the total number of undergraduate and graduate majors in EDCI for each semester (Fall 1976 - Spring 1980). The resulting values, while conservative because they do not take into account the secondary certification students, ranged from a minimum value of .192 to a maximum of .284. These latter ratio values are thought to represent the departmental contribution to the secondary program in teacher education. Finally, the respective values were combined in accordance with the following equation to yield cost estimates for the dean's staff/semester:

Dean's staff costs = .5 total budget × .228 × (.284 − .192).

Cost contributions of the department head in EDCI to the operation of the secondary teacher preparation programs were determined by multiplying the semi-annual salary of the department head by the ratio of secondary students to the total number of undergraduate and graduate students majoring in EDCI. The salary values and student enrollment figures were obtained from the EDCI secretary for business affairs and the administrative assistant to the department head, respectively. Cost estimates of the department head for the education technology course (EDTC 405) were obtained from the department head in Industrial Education. Costs per course were then calculated by dividing the administrative cost by the total number of semester hours in secondary education offered that semester and then multiplying the quotient by the semester hours offered for a particular course (number of sections multiplied by semester hours of course). In the case of Educational Psychology, administrative and management costs were combined, thus values for department head costs for the two Educational Psychology courses (EPSY 301, 321) are reported under the management category.

Additional administrative costs of supervising the secondary level student teaching program were determined from EDCI operating expense allocations 1976-80. Specifically, values for student teaching supervision and coordinator of field experiences were summed and multiplied by the ratio of secondary students to the total number of undergraduate and graduate students in EDCI. An example of the resulting values from this myriad of calculations are reported in Table 2.

Management

Cost items obtained for this category include salaries of secretaries and program coordinators whose work and supervision directly influenced secondary teacher education. Information regarding faculty and staff salaries were obtained from the EDCI secretary for business affairs, while enrollment figures were obtained from the administrative assistant to the department head in EDCI. Secretarial support for the secondary program was calculated by summing the salary of the secondary records analyst with adjusted salary values for the certification secretary and field experience secretary. The adjusted salary figures were determined by multiplying their salary values by the ratio of secondary students to the total number of students in EDCI.

Cost values for coordinators in secondary education and field experiences were determined by adjusting their faculty salaries in terms of the contribution their management function influenced their semester teaching loads. Typically, the teaching load of program coordinators is reduced by three semester hours or one course. An example of one semester values resulting from these calculations are provided in Table 2.

Faculty

Cost data for faculty teaching the required coursework in secondary education were obtained from the department head's office in educational curriculum and instruction (EDCI), educational psychology (EPSY) and industrial education (educational technology EDTC). Actual salary figures for individuals teaching in the undergraduate program during 1976-1980 were obtained from EDCI and EPSY. These data were subsequently transformed to program costs by applying the following equation:

$$\text{faculty costs to secondary education program} = \frac{\text{annual salary of Professor}}{\text{number of semester hrs. required for full-time position}} \times \text{number of semester hrs. taught in secondary education}$$

Resulting values from these computations were recorded in tables similar to Table 2 reflecting the semester costs per major cost category. Conversely, faculty costs for the course EDTC 405 were determined from current estimates of faculty involvement by the department head in Industrial Education. The current cost estimate for teaching EDTC 405 was subsequently converted to cost estimates for the semesters between Fall Semester 1976 and Spring Semester 1980. The conversion of current costs to historical

Table 2

COST SUMMARY FOR SECONDARY TEACHER PREPARATION PROGRAMS

Operational Costs	Fall 1976 EDCI 120	EDCI 220	EDCI 221	EDCI 323	EDCI 401-7	EDCI 425	EDTC 405	EPSY 301	EPSY 331	Subtotals
Administration										
Dean's Staff	112	224	336	672	447	672	672	672	336	4143
Department Head	205	409	614	1228	819	1093	744	---	---	5112
Management										
Secretarial Time	284	569	853	1706	1137	1706	297	480	240	7272
Coordinator of Field Exp/ Coordinators of Program	92	184	277	553	369	2053	---	---	---	3528
Program Teaching/Services										
Faculty	1500	1967	---	4837	5452	14014	4464	6533	200	41,967
Materials	7	14	20	41	27	121	---	120	60	410
Equipment	---	---	---	---	---	---	744	20	10	774
Facilities										
Cost of Rooms	300	300	600	1200	600	---	1200	1200	600	6000
Maintenance	10	20	30	61	40	61	---	---	---	222
Services	36	73	109	218	145	328	---	---	---	909
Subtotals	2546	3760	2839	10516	9036	20048	8121	9025	4446	70,337

costs were determined by multiplying cost ratios of total departmental costs in EDCI (e.g., 1976 operating costs/1983 operating costs) with the current estimated expense of teaching EDTC 405. This procedure was repeated for each of the semesters addressed in this evaluation.

Materials

Materials expenses were obtained from departmental operating expense allocations from 1976-1980 in EDCI. However, since material costs in EDTC 405 are passed on to the student as laboratory fees, the department does not reflect an expenditure for materials for that course. For EPSY, cost estimates for materials associated with courses EPSY 301 and EPSY 321 were obtained from the department head. Material costs per course reflected in Table 2 were calculated by dividing the cost of materials by the total number of semester hours offered during that semester. This quotient was then multiplied by the semester hours offered for a particular course (number of sections multiplied by semester hours of course).

Equipment

Costs for equipment outlay were estimated by the department heads in EPSY and EDTC respectively. These values are presented for one semester in Table 2. For EDTC, current equipment costs for EDTC 405 are provided. These estimates were converted into historical cost estimates in the same manner as faculty costs discussed previously. In the case of EDCI, equipment allocations were not included as a line item in the departmental operating expense allocations, thus the cost category was not completed.

Facilities

Costs of facilities were determined by the "shadow cost" technique, that is, the expense of renting space at a community center for holding class was computed. This technique was used because information on room rent or facility use was not available from departmental, college, or office of university planning sources. The following values were used to determine facility costs.

Credit hour of course	Number of Sessions	Cost/ Section
1 hr	15	$150
3 hr	30	300
4 hr	30	300

Additional facility costs were obtained from maintenance of facilities for the coursework offered by EDCI. For EDCI, maintenance values were obtained from departmental operating expense allocations from 1976-1980. The allocated values were then adjusted to reflect the secondary program costs by multiplying the cost by the ratio of secondary students to the total enrollment. Costs per course were then calculated by dividing the maintenance cost by the total number of semester hours in secondary education offered that semester, then multiplying the quotient by the semester hours offered for a particular course (number of sections multiplied by

semester hours of course). An example of the semester costs for facilities is presented in Table 2.

Services

Operating expenses, including costs of telephone, printing, mail, and computer, were obtained from departmental operating expense allocations for secondary education in EDCI from 1976-80. Corresponding values for the secondary field experience were obtained by multiplying the allocated values for field experiences by the ratio of secondary students to total enrollment in field experiences. Service costs per course were then calculated in the same manner as described in the preceding section for facility costs per course. Cost of services were not provided by EPSY or EDTC, thus entries for this major cost category were not provided in Table 2.

Table 3 presents a summary of total costs over an eight semester period (fall 76-spring 80) for the two programs in secondary teacher education. From the perspective of the College of Education, the certification option is less costly than the program for education majors, i.e., $47,913, compared with $79,935. Ironically, the total costs during the Fall Semester, 1976 and the Spring Semester, 1980 are not too different for secondary majors, yet substantial fluctuations occurred during this time period, e.g., Spring 78 - $98,594 to $68,147 - Fall 79. This variation in costs during the eight semester period reflects the fluctuations in undergraduate enrollment in secondary education in comparison to total enrollment in EDCI.

COMBINING COST AND EFFECTS DATA

Costs Per Student

At first glance, it may appear that the education major alternative is 66.8 percent

Table 3

SEMESTER COST COMPARISONS OF TWO PROGRAMS IN SECONDARY TEACHER EDUCATION

Semester	Education Major Program	Certification Program
Fall 76	70,337	48,625
Spring 77	85,113	56,728
Fall 77	79,734	47,290
Spring 78	98,594	49,562
Fall 78	78,329	49,522
Spring 79	83,288	48,718
Fall 79	68,147	39,448
Spring 80	75,938	43,411
Total	$639,480	$383,304
Average	$ 79,935	$ 47,913

more expensive than the non-education major alternative ($79,935 average cost per semester compared with $47,913.) However, these figures need to be adjusted for the number of students enrolled in the two alternatives to give the average cost per student per semester—a more accurate indication of instructional costs. Table 4 contains these average costs per student for each of the eight semesters.

Table 4

COST PER STUDENT COMPARISONS FOR THE TWO PROGRAMS

	Majors			Non Majors		
	Cost	Students	Cost/Student	Cost	Students	Cost/Student
Fall 76	$ 70,337	508	$138.46	$ 48,625	79	615.51
Spring 77	85,113	582	146.24	56,728	102	556.16
Fall 77	79,734	485	164.40	47,290	55	859.82
Spring 78	98,594	379	260.14	49,562	79	627.37
Fall 78	78,329	459	170.65	49,522	65	761.88
Spring 79	83,288	381	218.60	48,718	54	902.19
Fall 79	68,147	385	177.01	39,448	45	876.62
Spring 80	75,938	323	235.10	43,411	68	638.40
Total	$639,480	3502		$383,304	547	
Average	$ 79,935	437.8	$182.58	$ 47,913	68.4	$700.48

Over the eight semesters, it cost an average of $182.58 per semester for each student enrolled in the education major program, but $700.48 per semester for each non-major student enrolled. Thus it might appear that the non-major program is 3.8 times more expensive than the major program. This is not the case, of course. What these figures represent is the average cost per student for each program if the courses included were offered *only* to those students in the program. In other words, it would cost $700.48 per student to train the non-majors if an average of only 68 students took the courses each semester.

In practice, these courses are not taught independently for the two alternative programs. One could assume that the 68 non-major students were simply joining the 438 major students each semester in courses already being offered for the education majors. This would amount to a 15.6 percent increase in the number of students taking the courses. Such an increase might be viewed as sufficiently minimal as to cause no real increase in the costs to the department. Under that view, the non-major program could be seen as costing the department nothing. The total education major program cost of $79,935 could then be allocated across a total of 506 students, for an average cost per student per semester of $157.91.

One needs to be careful in comparing program costs. Depending on the point of view, one can say that the education major program is 66.8 percent more expensive, that the non-major program is 3.8 times more expensive, or that the non-major program is in fact free.

Costs and Effects

Obviously the college of education could certify secondary teachers at an average cost of only $47,913 per semester. It is currently spending an additional $32,022 average ($79,935-$47,913) per semester to prepare secondary education teachers within an education major. With an average of 438 students per semester, this amounts to an additional $73.14 per student per semester to train secondary teachers with an educational major.

Is the additional $73.14 per student per semester being well spent? The effects data reveal no differences in student morale and mixed differences in supervisor ratings of instructional skills across the two programs. The education majors do score 10 percent higher, however, on measures of teaching performance based on learner cognitive attainment data.

The analyses performed within this study do not enable us to say whether a 10 percent improvement in teaching ability is worth an additional $73.14 per student per semester. We currently lack comparable information on which to base a comparison. At this point the subjective judgments of experienced faculty are probably the best guide.

Implications

This investigation has linked "program effects" with cost data for alternate programs in secondary teacher preparation. This linkage represents a significant relationship which department heads and deans in colleges of education are sensitive to in these times of financial shortfalls and press releases on quality deficiencies in teacher preparation. Results from this inquiry can be applied as baseline indicators of cost/effect units when future program revisions are being considered, and as a means of comparing start-up costs -vs- operational costs for a program. In particular, the outcomes of this inquiry, i.e., a 10 percent increase in learner cognitive attainment costs an additional $73 a semester per student, may have direct implications for whether teacher education programs should consider extending their preparation period for teachers. If the press is for quality, with costs being secondary, these findings provide encouraging information to program developers. However, if costs are primary, and quality effects are secondary, these findings should serve as caution indicators to the development team. At the very least, integrating costs with effects provides additional information for program decision-makers to use in reaching summative decisions about their teacher education program.

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